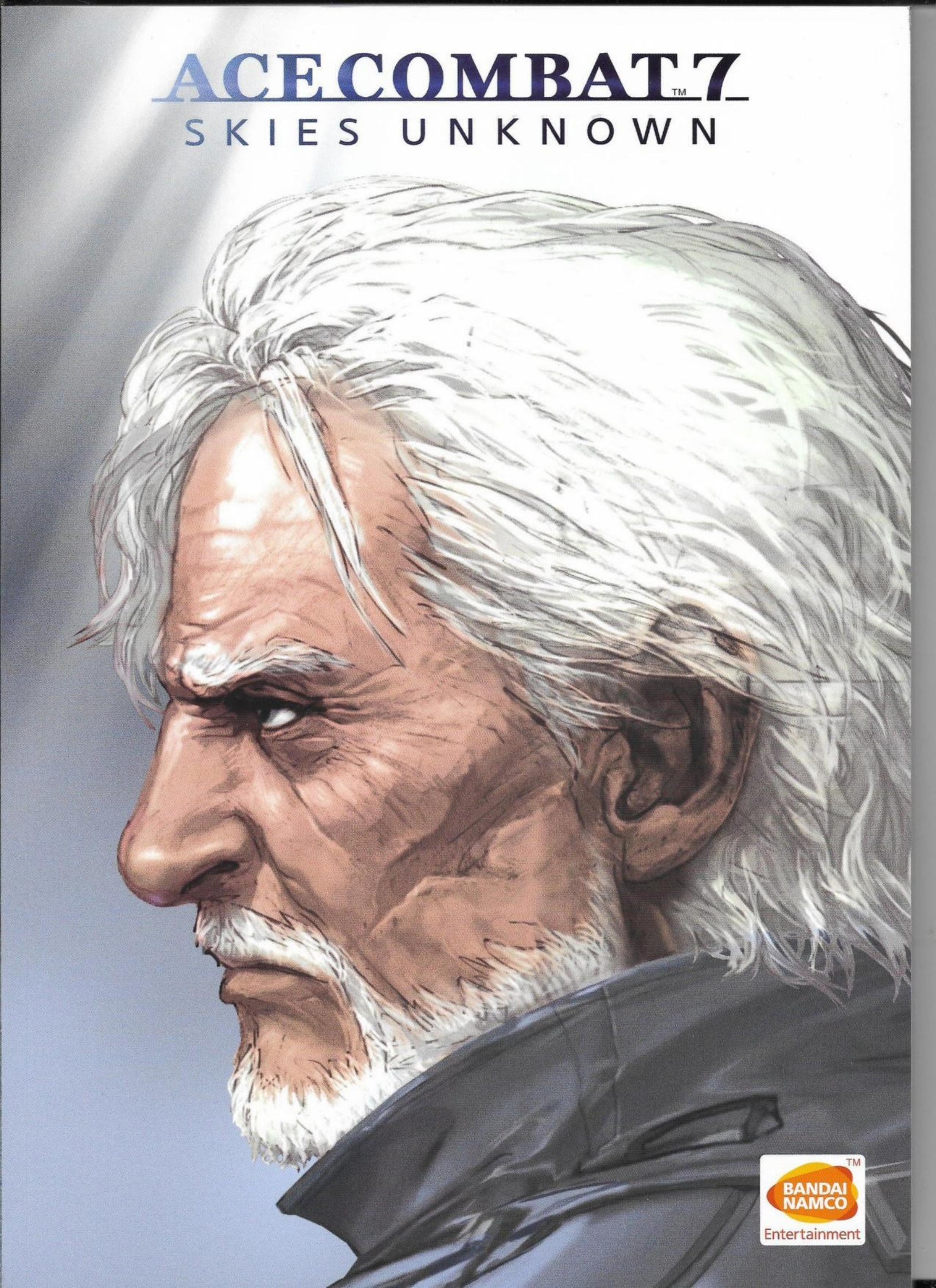
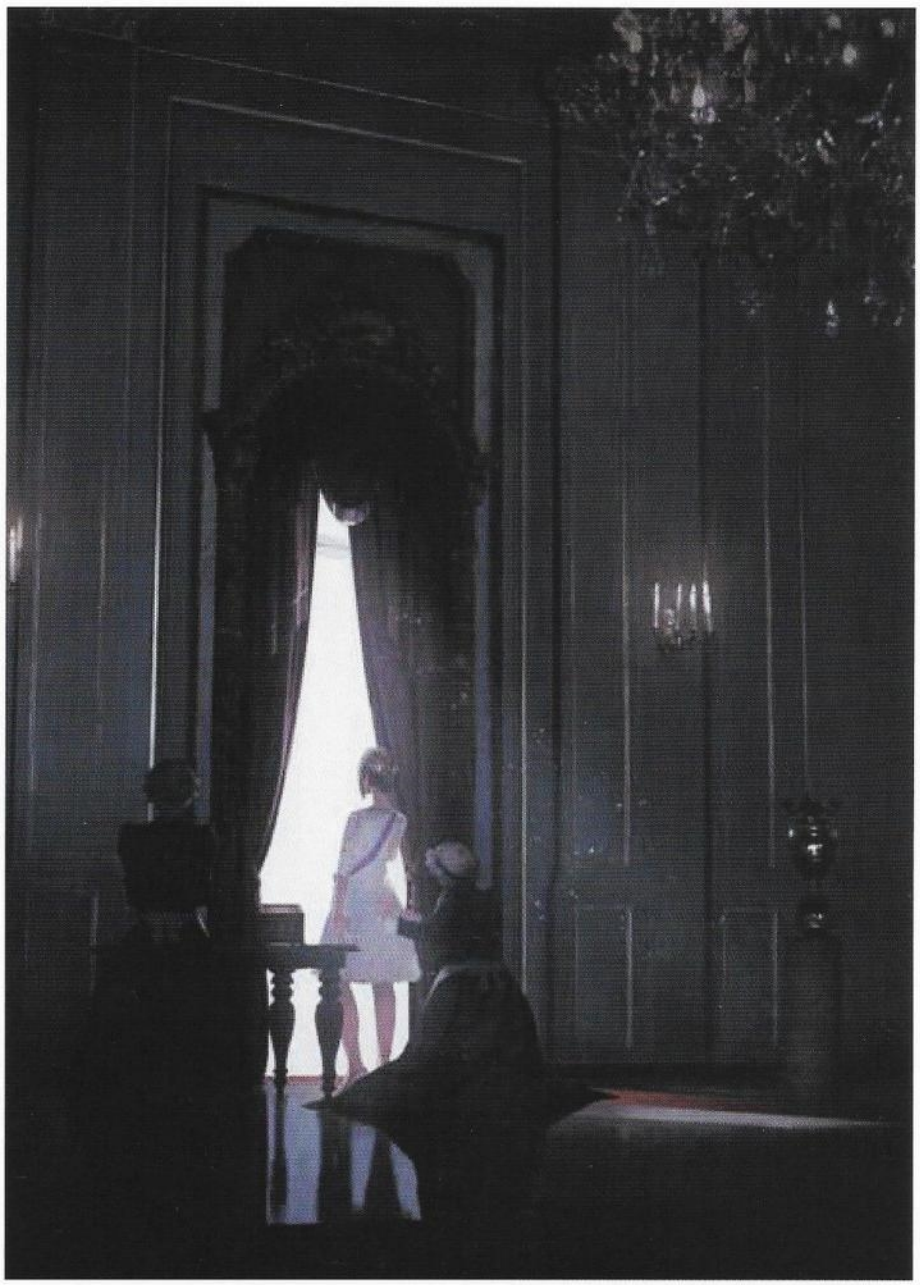
ACE COMBAT™ 7

SKIES UNKNOWN



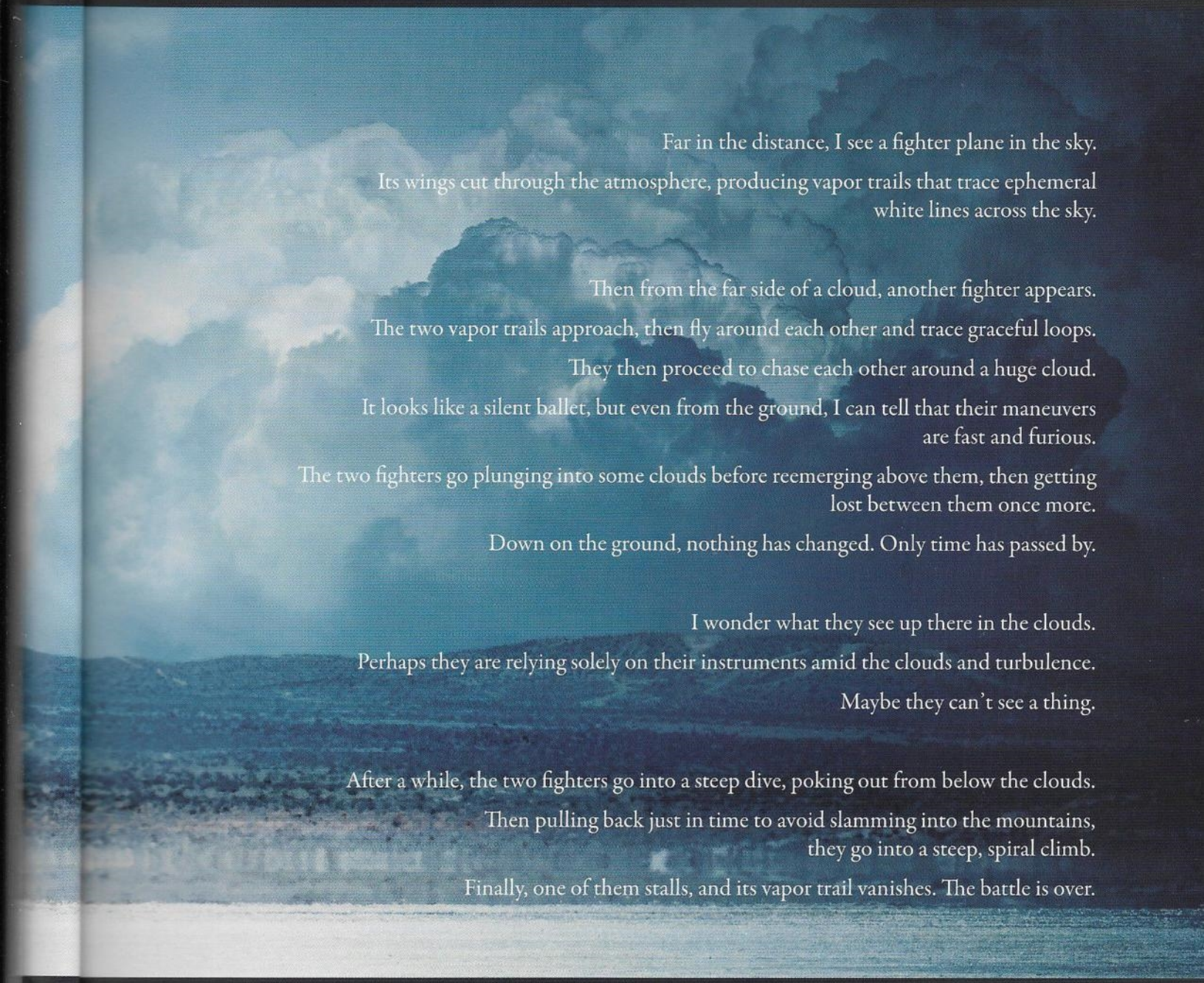
BANDAI NAMCO™ Entertainment



Princess Cossette's Inaugural Address

Rosa Cossette D'Elise became Princess of the Kingdom of Erusea. After an audience with the King and other heads of state, she appeared before a crowd of 100,000 that had gathered. The old Kingdom of Erusea has been restored in a bid to bring order to the chaos that resulted following the kingdom's defeat in the Continental War. Will the common-born princess be able to lead the country out of the troubled postwar period?

Between the Ground and Sky



Far in the distance, I see a fighter plane in the sky.

Its wings cut through the atmosphere, producing vapor trails that trace ephemeral white lines across the sky.

Then from the far side of a cloud, another fighter appears.

The two vapor trails approach, then fly around each other and trace graceful loops.

They then proceed to chase each other around a huge cloud.

It looks like a silent ballet, but even from the ground, I can tell that their maneuvers are fast and furious.

The two fighters go plunging into some clouds before reemerging above them, then getting lost between them once more.

Down on the ground, nothing has changed. Only time has passed by.

I wonder what they see up there in the clouds.

Perhaps they are relying solely on their instruments amid the clouds and turbulence.

Maybe they can't see a thing.

After a while, the two fighters go into a steep dive, poking out from below the clouds.

Then pulling back just in time to avoid slamming into the mountains, they go into a steep, spiral climb.

Finally, one of them stalls, and its vapor trail vanishes. The battle is over.

As they leave to return to wherever they came from, I wonder what the ground is to them.

Is it somewhere they return to after their death-defying high-wire act or is it where the people they must protect live?

Or is it simply a flat surface for them to land upon?

Separated by the horizon, the ground and the sky are different worlds.

And here I stand between them.

INDEX

Section #01
012 THE BELKAN WAR

Section #02
022 CONTINENTAL WAR
034 Short Story "The White Notebook"

Section #03
038 PACIFIC WAR
052 Short Story "Green Hills"

Section #04
058 EMMERIA-ESTOVAKIA WAR
070 Short Story "After the Blue Dove"

Section #05
076 LIGHTHOUSE WAR
088 Masato Kanno × Yoshio Aoki
106 Kosuke Itomi × Hibiki Yoshizaki
116 State-of-the-Art Fighter Aircraft Development
122 From Drones to Unmanned Aerial Vehicles
128 Short Story "Rose"
134 Kazutoki Kono × Sunao Katabuchi

Section #06
140 HISTORY OF WAR

ACES at WAR
A HISTORY

2019

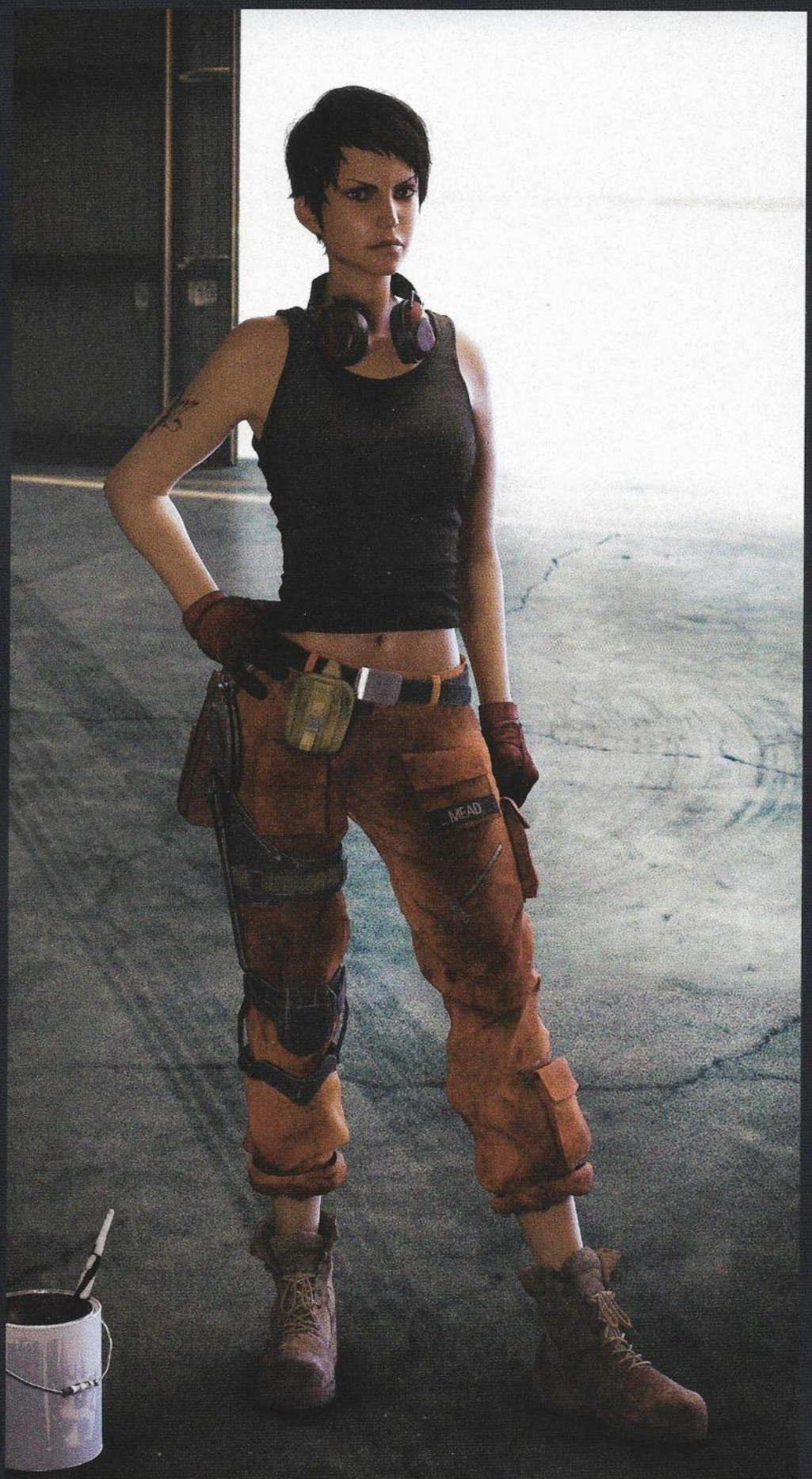
INTRODUCTION

Some 100 years have passed since humankind first set its sights on soaring through the sky. And soon after the airplane was born, it was used to wage war. Ever since, we have been seeking ever better ways of winning battles by improving its propulsion method, devising new wing structures, and equipping new weaponry. We have also been constantly updating the way we fight.

There have been a number of innovations along the way, including the emergence of fighter planes capable of dogfights, advances in aerodynamics, electronic warfare using radar, the adoption of jet engines, the practical implementation of missiles, the introduction of data processing, and the advent of stealth theory.

But it was IT technology that dramatically transformed warfare. We now live in an age in which fighter plane combat centers on digital networks and where manned and unmanned aircraft battle it out in the sky.

However, the times may change and combat technology along with them, but the essence of warfare remains the same. By studying the wars of the past, we should be able to foretell our future.


MEAD

ACES at WAR

A HISTORY

2019

ACES at WAR : A HISTORY 2019

HISTORY OF WAR FROM THE BELKAN WAR TO THE LIGHTHOUSE WAR

To say that modern history is a "history of war" is no exaggeration. The world has survived a great many wars, but it has yet to achieve true peace.

This book takes a fresh look back at that war-torn history in an effort to find out why we fight and why peace is so elusive.

We hope that by reading it, you will get a taste of the looming dread, unbearable pain, and the hopes for peace and salvation held by those who lived in this turbulent age.

「SKIES UNKNOWN」

R

The Principality of Belka

A military power located in the East of the Osean Federation. Capital City, DInsmark.
Historically, it was a leading scientific and industrial power, and pushed forward a policy of imperialism. However, the domestic administration could not deliver on this policy and suffered economic collapse. The far-right party took advantage of this situation and grabbed control in 1991.
In 1995, the Principality of Belka declared war and dropped seven nuclear bombs on its own country, but were still defeated. This caused total devastation and the decline into ruin of the whole country.

The Republic of Ustio

A small but relatively wealthy country located in the South East of Belka. Capital City, Directus.
Originally ruled over by the Principality of Belka, it sought independence in 1988 after an amendment of Belka federal law.
An adundance of natural resources were discovered here in 1995 and this added to the reason behind the Principality of Belka's declaration of war. It formed a coalition army with the Kingdom of Sapin, Osean Federation and the Union of Yuktobanian Republics, and helped in the alliance's victory.

Kingdom of Sapin

A Kingdom with a country located in the South of The Principality of Belka. Capital City, Gran Rugido
With no notable recognition as a global power, it borders the Republic of Ustio and the Principality of Belka, and joined the allied forces in the Belkan War.
It played a tactical role as its other neighboring country and ally, the Osean Federation, is separated by the Orea Bay and the Futuro Canal.

Osean Federation

A Superpower and, along with the Yuktobania federal state, a vast country. Capital City, Oured.
A federal state that adopted a presidential system and championed a capitalist democracy, it has always been eager to expand its empire, causing the Osean War from 1905 to 1910. In the Belkan War, with many conflicts under its belt and a completely modernised army, it aligned itself with the Republic of Ustio.

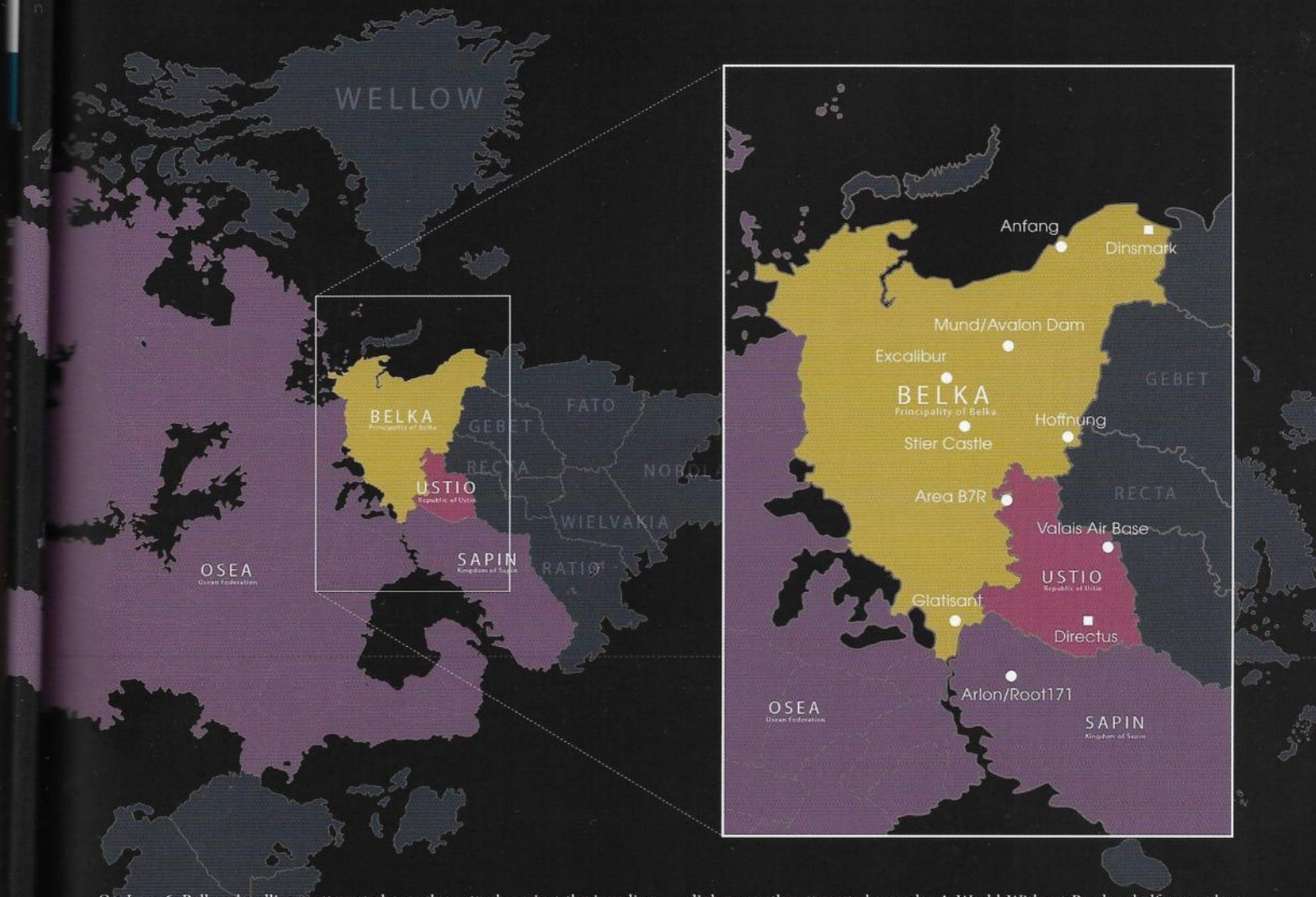
Section #01

THE BELKAN WAR

03.1995 – 12.1995

SEVEN BOMBS THAT SHOOK THE WORLD
THE BLOOD OF MIGHTY BELKA SPILLED

From the beginning of the 20th century, the Belkan Federation competed with its neighbor the Osean Federation in military buildup and expansion of territory, but as it took control of more land, the cost of maintaining armies became unmanageable. In December of 1987, the federation withdrew forces stationed in its eastern states to the Principality of Belka while simultaneously transferring political authority to them.
At the beginning of 1988, the federation's laws were revised, giving these eastern territories a chance at independence. The first to separate from the federation was Gebet, which did so on February 28, followed by the Republic of Ustio on May 12. On August 29, 1991, the remainder of the federation's territory was sold to its eastern neighbors, and northern islands and the Great Lakes region were ceded to the Osean Federation. By this time, the Belkan Federation had suffered an economic collapse with no way out in sight.
In addition to ceding territory, heads of the Belkan government agreed to jointly finance the Great Lakes Resource Development Company with Osea as a way to rebuild their own economy and forge a cooperative path forward, but it was later discovered that the Oseans had been covering up the fact that the company had been operating at a loss. Anti-Osean sentiment rose among Belkan citizens as they suspected the project was only a ploy to disguise a land grab, which was worsened by frustration with their own government for allowing the independence of their eastern territories, resulting in large-scale riots.
In 1992 the far-right Belkan Liberal Democratic Party channeled that discontent into support and effectively gained complete control of the government. Enjoying overwhelming approval from the masses, the administration grew continually more authoritarian. Meanwhile, vast resources were discovered underground in the neighboring Republic of Ustio, and the Federation of Belka's Supreme Court, which had lost its judicial independence, decided, "Revision of the Federation's laws was due to unconstitutional interference by outside states, and the independence of eastern territories is invalid." Belka's military had been growing since the administration began, and with a cause to spur them forward, their forces were ordered to mobilize and gather at the borders.
On March 25, 1995, the Belkan Federation declared war on the surrounding nations. None were prepared, so they fled, allowing Belkan forces to make deep invasions into their territories. The Republic of Ustio was struck especially hard, losing most of its land except for rugged mountains within only a few days. A joint operation was planned between the invaded nations, centered around the Osean Federation, the Kingdom of Sapin, and the Republic of Ustio. Under this, Ustio's provisional government concentrated its air power at the one place it could, Valais Air Base, which was geographically isolated in the eastern mountains. What remained of the 6th Air Division was joined by squadrons of foreign mercenaries. On April 20, the Allied Forces began a naval advance as part of their joint operation. This was a diversion which allowed a two-plane formation from the 6th Air Division to make a reconnaissance-in-force mission into Priority One Strategic Airspace B7R, also known as the Round Table, on the Belkan eastern front. The Belkan elite squadron that was sent to intercept the formation was completely destroyed. On May 13, allied forces including the 6th Air Division began an operation to liberate the capital from the Belkan command in Ustio. Bordering nations that had been quietly watching the situation quickly joined the battle in hopes of access to former Belkan Federation resources once the war ended. On May 17, plans for a nuclear weapons program as well as the V2 system, a mass retaliation weapon, were revealed, and the heads of the Allied Forces decided upon an invasion of Belka. The Belkans responded by employing Excalibur, a homeland defense chemical laser system, to wipe out the Allied Forces moving across the border from Ustio. On May 23, allied air forces used mid-flight refueling to send an expedition into the Tauberg Hills deep in Belka. Ustio's 6th Air Division destroyed Excalibur, and the allied push gained momentum.



On June 6, Belkan hardliners attempted a nuclear attack against the invading Allied Forces, and seven small tactical warheads from a V1 system exploded in the Waldreich Mountains. Seven towns that connected Belka's north and south vanished. The Allied Forces were thrown into confusion, and while they ultimately won the battle, they were forced to halt their advance into northern Belka. The Belkan Federation also reeled from the blow, both politically and militarily, and quickly sought a ceasefire, which led to the provisional Belkan government signing a surrender pact on June 20.

On December 25, A World Without Borders, a renegade army with soldiers from the countries including the Osean Federation, the Kingdom of Sapin, the Republic of Ustio, and the Union of Yuktobanian Republics, led by senior officers from the Belkan military, launched a massive, multinational coup d'état. The organization used the top secret XB-0 Hresvelgr heavy command cruiser to bomb Lumen, where the peace accord was signed. Allied interceptors scrambled from Valais Air Base were able to successfully shoot down the rebel army's planes, including the XB-0. During the battle, the Allied Forces learned that the enemy's military included many allied aircraft. On December 31, the Allied Forces approached the secret V2 missile facility in Avalon Dam in northern Belka, which had been taken by the rebels, and were able to stop preparations for a launch of mass retaliation weaponry. The Allied Forces committed everything possible to stopping the V2 launch, including sending a large number of squadrons from Valais Air Base in the Republic of Ustio. The rebels in turn used their main force to repel the attack, but the Allied Forces succeeded in destroying the ADFX-02 experimental fighter that controlled the dam's missile launch system. One V2 missile was fired during the battle, but the aircraft controlling it was shot down immediately afterwards, and the warhead detonated outside the atmosphere, preventing disaster.

While the aftermath of the Belkan War was chaotic due to the use of nuclear and electromagnetic weapons, the erasure of records, and intensified resource diplomacy, the attempted coup by A World Without Borders half a year later caused even greater turmoil.

After the collapse of the rebel forces as a result of the fall of Avalon Dam, many of the instigators from Belka, as well as traitors from the Allied Forces, were arrested in various nations. Among the Allied Forces, Former Osean Air Defense Force Captain Joshua Bristow, who had disappeared after the war and was suspected to be one of the founders of A World Without Borders, was arrested for terrorist conspiracies including an attempt to assassinate the Osean president. Other underground Belkan hardliners and rebel remnants continued to engage in terrorist attacks and schemes, and intelligence officers and special police continued to search for them.

Meanwhile, brilliant commanders and researchers from Belka were often coaxed to the Osean Federation after the war as valuable human resources, which allowed some to escape prosecution for war crimes. Others defected to the Federal Republic of Estovakia and other friendly nations, spreading Belkan military and technical expertise to these countries.

Conflicting reports after the war included confirming the number of people killed. Investigations were hindered by the geography in battlefields like the B7R airspace, which made searching for bodies difficult, and this was further complicated when not all bodies matched records or when information was lost or forged.

National borders had been unstable for years, but the ceasefire accord settled them for a time. Eastern regions were restored to their prewar independence, and their former borders were returned. The Principality of Belka, however, was reduced to less than half of its size before the war after ceding the South Belka region to the Osean Federation as a trust territory. In addition, rights to the natural resources in the former Belkan Federation, one of the causes of the war, were divided by the victorious nations through diplomatic channels. However, the greed seen in this "disgusting scramble for a piece of the pie" became a point of propaganda for the coup to follow.

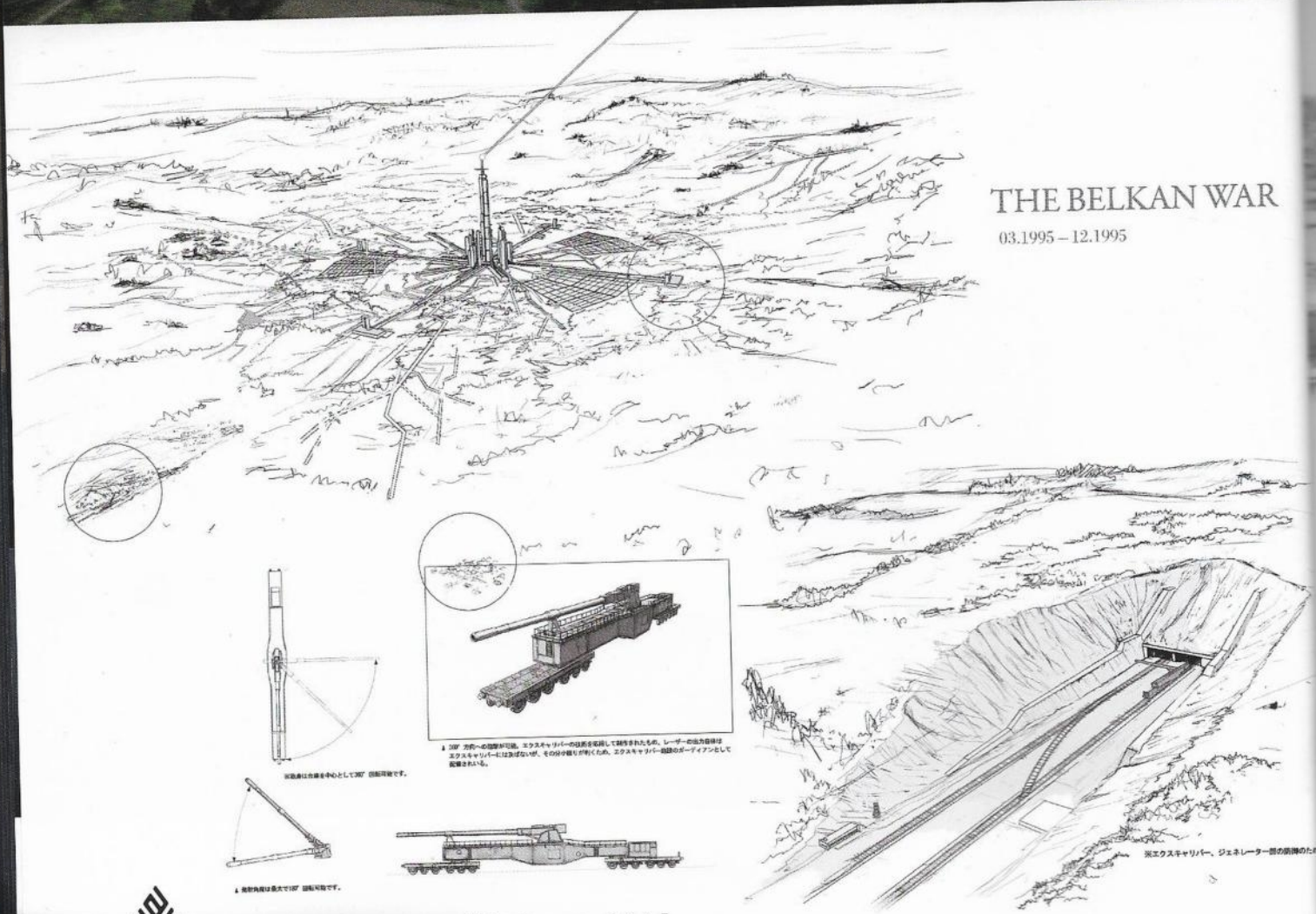
Advocating a Strong Belka

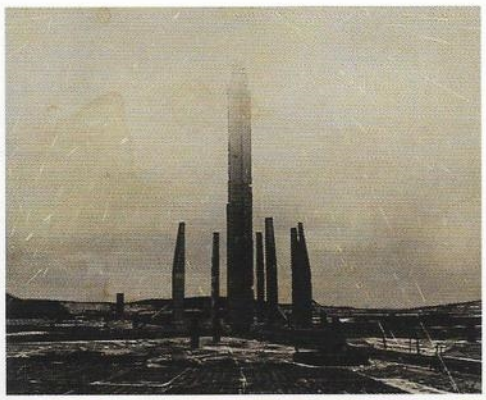
Photographed 5/23/1995

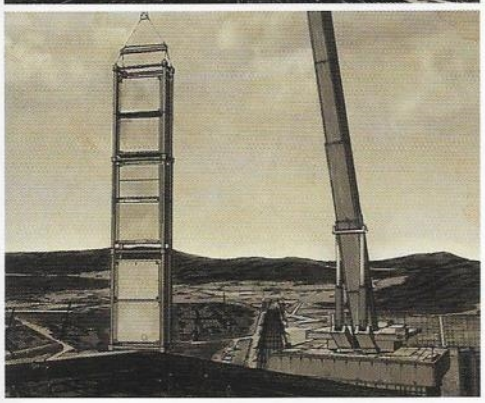
The tower was built tall not only for the practical objective of expanding its range of fire, but also to show the Principality of Belka's strength to its people as well as the rest of the world. It was as if Belka's mighty military technology was declaring its superiority by saying, "The nation that has it first will rule the world." Excalibur is a symbol of that—an unadulterated advocation for a strong Belka.

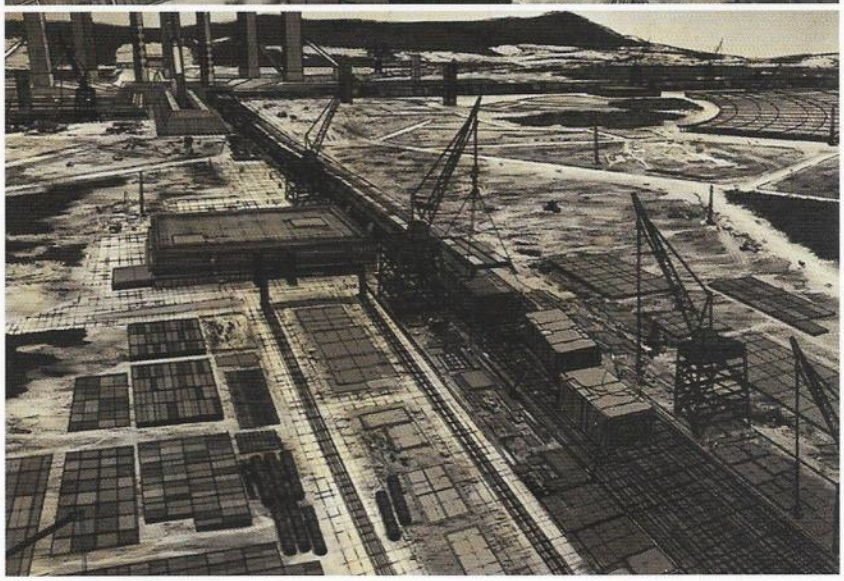
THE BELKAN WAR

03.1995 – 12.1995



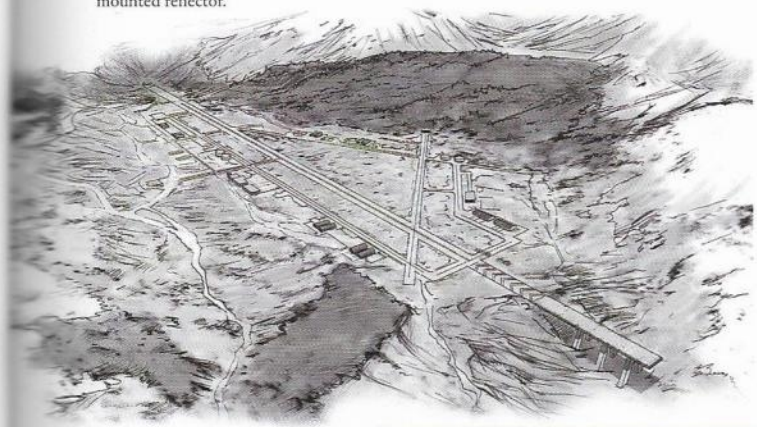






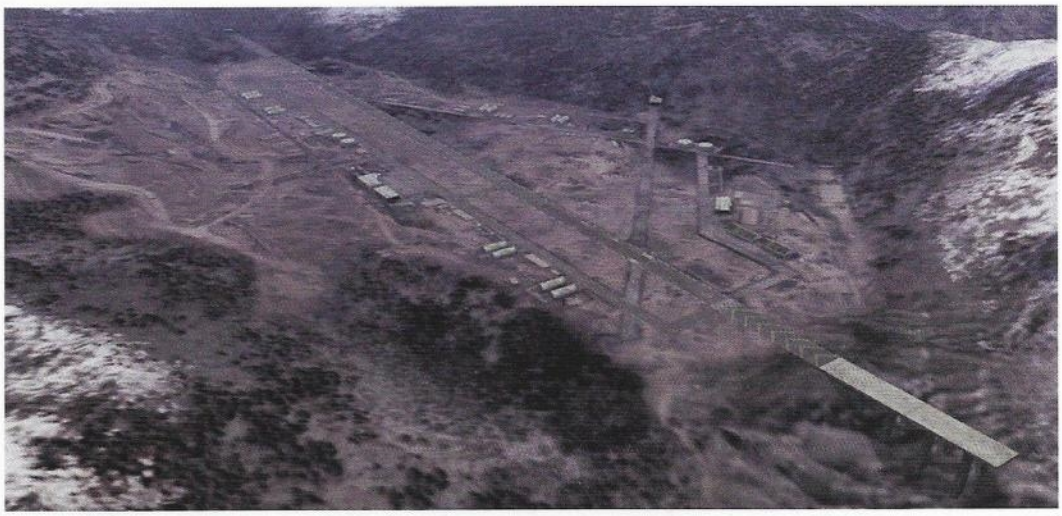
Excalibur

Excalibur, a.k.a. the Sword of Annihilation, towering over the Tauberg Hills when it was still shiny new. This chemical laser weapon intended for homeland defense was designed as part of the Belka Ballistic Missile Defense (BMD) program, which commenced in 1981. The tip of the tower emits a laser for approximately 8 seconds per shot, delivering a devastating punch to its target. The weapon's engineers declared that it would be theoretically possible to achieve a firing radius of 1,200 km if used in combination with a satellite-mounted reflector.



Valais Air Base

While the Republic of Ustio was devastated in the Belkan War, Valais Air Base remained utterly unscathed until the day the armistice was signed. That is why Ustio decided to station its provisional government here in this remote location. However, on December 25, 1995, an air squadron of the rebel group A World With No Boundaries launched a strike that dealt significant damage.



Frontier Fortress

Photographed 6/20/1995

Valais Air Base, the final fortress in the Republic of Ustio. The 6th Air Division is stationed here, deep within the Tyrann Mountains. In peacetime, the base's main function is to keep watch along the frontier region. At the start of the Belkan War, before the blitz conducted by the elite air squadron of the Belkan Air Force, many of the pilots of the 6th Air Division were lost, forcing it to quickly reorganize with foreign mercenaries. The base's location among lofty mountain peaks requires superior piloting skills for takeoffs and landings.

The Final Resistance

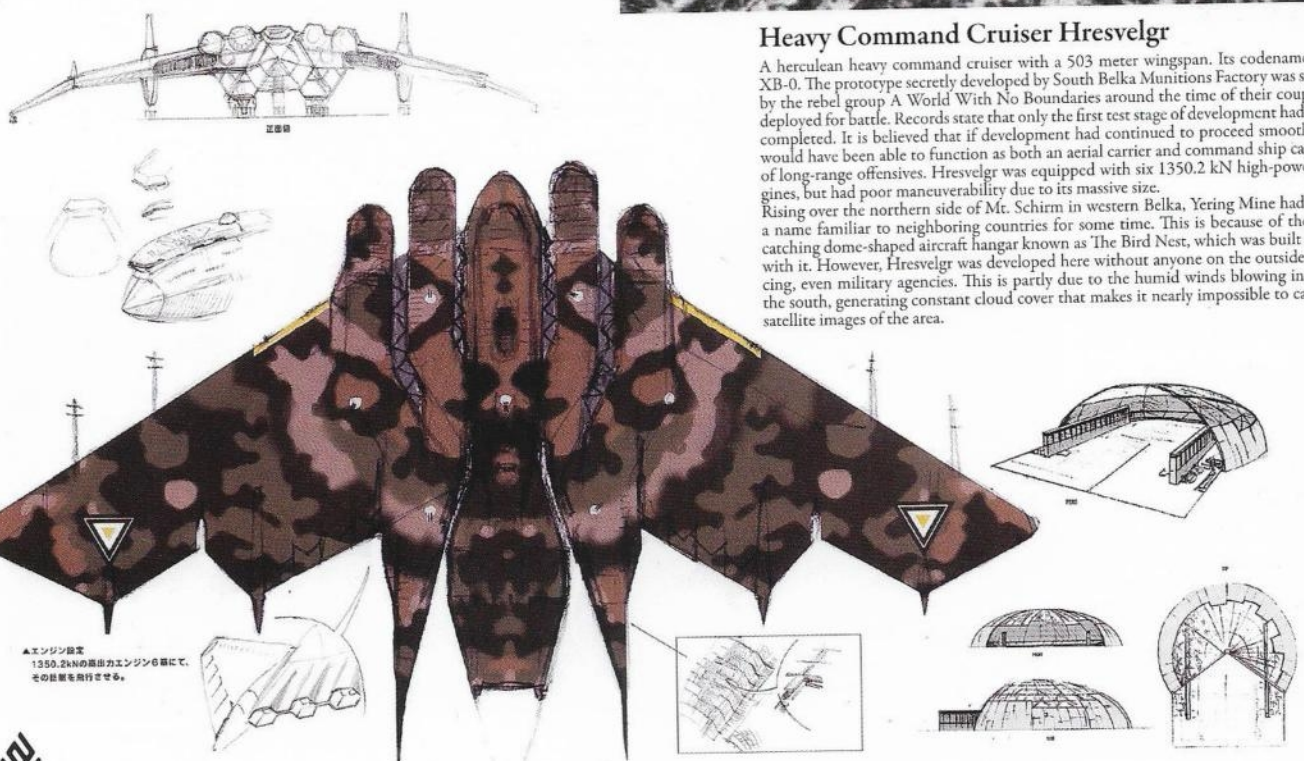
Photographed 12/25/1995

The Allied Forces first deployed Hresvelgr in an actual battle during the campaign mission known as the Talon of Ruin. The photo to the right is a precious shot taken with great difficulty during that battle. Hresvelgr successfully executed a surprise attack on Valais Air Base in the Republic of Ustio, but suffered a counterattack after failing to keep Galm Team on the ground. The air squadron escorts aligned with the rebel group known as A World With No Boundaries were no match for Galm Team, and Hresvelgr was shot down over the Waldreich Mountains on its maiden flight.

Heavy Command Cruiser Hresvelgr

A herculean heavy command cruiser with a 503 meter wingspan. Its codename was XB-0. The prototype secretly developed by South Belka Munitions Factory was seized by the rebel group A World With No Boundaries around the time of their coup and deployed for battle. Records state that only the first test stage of development had been completed. It is believed that if development had continued to proceed smoothly, it would have been able to function as both an aerial carrier and command ship capable of long-range offensives. Hresvelgr was equipped with six 1350.2 kN high-power engines, but had poor maneuverability due to its massive size.

Rising over the northern side of Mt. Schirm in western Belka, Yering Mine had been a name familiar to neighboring countries for some time. This is because of the eye-catching dome-shaped aircraft hangar known as The Bird Nest, which was built along with it. However, Hresvelgr was developed here without anyone on the outside noticing, even military agencies. This is partly due to the humid winds blowing in from the south, generating constant cloud cover that makes it nearly impossible to capture satellite images of the area.

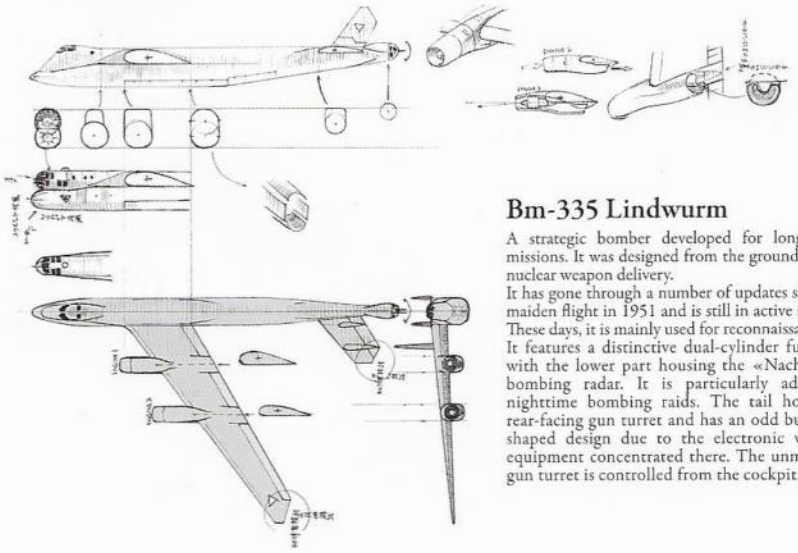


▲エンジン設定
1350.2kNの高出力エンジン6基にて、
その巨躯を飛行させる。

The Monster of Belka

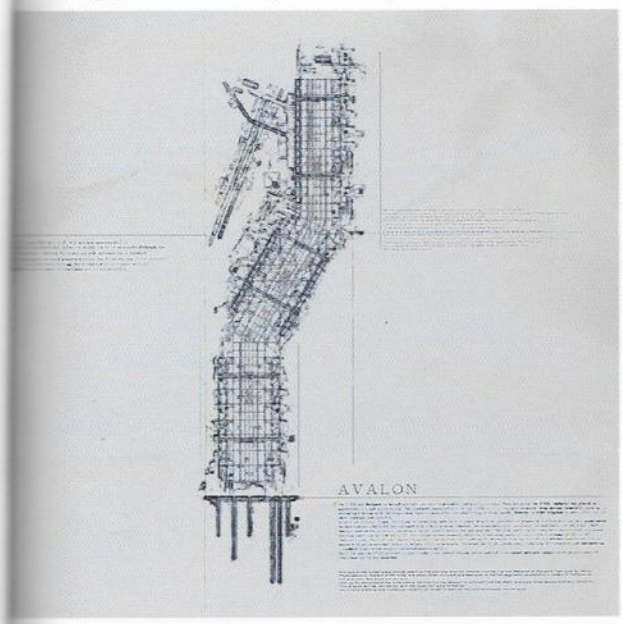
Photographed 4/4/1995

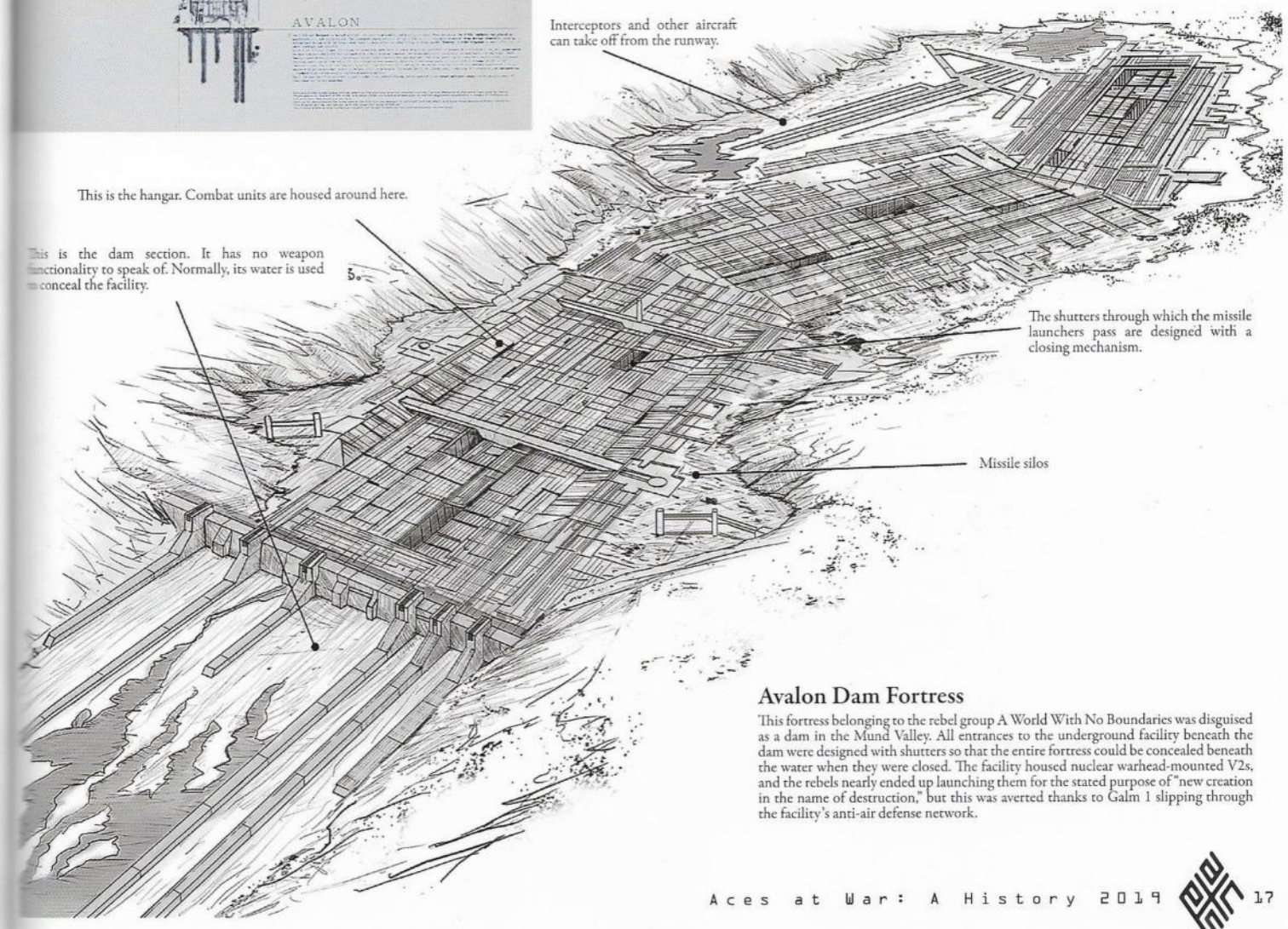
According the Allied Forces' remaining records, during the entire Belkan War, it appears that the Bm-335 was only deployed in the "Hunting Dog of the Frozen Sky" and "The Stage of Apocalypse" missions. Though this amounted to a small number of sorties, the common thread between them was the Belkan military's focus on ground strikes, which is one reason military analysts think highly of the aircraft's air-to-ground attack capabilities.



Bm-335 Lindwurm

A strategic bomber developed for long-range missions. It was designed from the ground up for nuclear weapon delivery.
It has gone through a number of updates since its maiden flight in 1951 and is still in active service. These days, it is mainly used for reconnaissance.
It features a distinctive dual-cylinder fuselage, with the lower part housing the «Nachtigal» bombing radar. It is particularly adept at nighttime bombing raids. The tail houses a rear-facing gun turret and has an odd bulbous-shaped design due to the electronic warfare equipment concentrated there. The unmanned gun turret is controlled from the cockpit.




Interceptors and other aircraft can take off from the runway.
This is the hangar. Combat units are housed around here.
This is the dam section. It has no weapon functionality to speak of. Normally, its water is used to conceal the facility.
The shutters through which the missile launchers pass are designed with a closing mechanism.
Missile silos

Avalon Dam Fortress

This fortress belonging to the rebel group A World With No Boundaries was disguised as a dam in the Mund Valley. All entrances to the underground facility beneath the dam were designed with shutters so that the entire fortress could be concealed beneath the water when they were closed. The facility housed nuclear warhead-mounted V2s, and the rebels nearly ended up launching them for the stated purpose of "new creation in the name of destruction," but this was averted thanks to Galm 1 slipping through the facility's anti-air defense network.

ADFX-01/02 MORGAN

Belka was a nation with a frigid climate, poor soil, and meager resources. The crisis mentality that came from the perpetual fear of starving and freezing to death gave rise to a tenacious and industrious people. The winters are long, with bitterly cold temperatures as low as negative 30 degrees centigrade. During the winter season, the people of Belka had been long engaged in in-home manufacturing, including metal work and textiles. Their manual dexterity had been cultivated amid this environment.
But following the Industrial Revolution, industrialization was Belka's only hope for survival. The development of optical products and precision equipment, including cameras and watches, were one of Belka's fortes. As a result, their laser technology and manufacturing skill in sensors and electronic equipment developed far beyond that of other nations.

This is a prototype for which development commenced in 1985 at the South Belka Munitions Factory. Its forward-swept-wing design, which included canards, did not take stealth capabilities into account. It is classified as a 4.5 generation fighter. The South Belka Munitions Factory was commandeered by A World With No Boundaries during its coup, but in exchange for the airframe, they demanded combat data from a skilled pilot. As its main weapon, the aircraft has a megawatt-class high-power laser (codenamed "Zoisite") that had been developed separately but was added at the last minute. The size of the laser unit could not be reduced with the technology at the time, so the ADFX-02 was the only aircraft on which it could be deployed. The unit's large size meant that it had to be piggybacked on the rear portion of the plane. Because of this, a limiter was installed so that it could not exceed 7 G.
The ADFX-02 was downed on December 31, 1995 during the air battle over the Avalon Dam Fortress. According to the analysis conducted on the flight recorder recovered from its wreckage, the g-limiter was switched off during the dogfight, after which it momentarily achieved a maximum of 11 G. We now know that the laser unit and hydraulic system suffered extensive damage because of this. That was followed by the left engine catching fire and then exploding after being hit by gunfire. There are signs that the pilot ejected, but it is unknown whether he survived.
Unfortunately, the remains of the aircraft have disappeared, but the precious combat data is still intact. Full-fledged development of the ADF-01 will commence based on this data.

Warplanes with as convoluted of a development history as the ADFX-01/02 Morgan are few and far between. The ADFX-02 was originally a prototype that the South Belka Munitions Factory developed with single-minded devotion around the time of the Belkan War. But the defeat of Belka and the signing of the armistice meant that work on the aircraft was never completed. The rebel group A World With No Boundaries subsequently staged a coup during which they commandeered the development facilities and the ADFX-02 itself. The plane was taken over by a pilot with the call sign Pixy and nickname Solo Wing, but it was shot down by the hero Galm 1 during the Belkan War. The ADFX-02 is confirmed to have had a tactical laser system (TLS) along with ballistic missile control functionality coordinated with the Avalon Dam Fortress.
The ADFX-01 was only completed after the Allied Forces took over the South Belka Munitions Factory during the Belkan War.

USTIO AIR FORCE UNITS INSIGNIA

Ustio Air Force 6th Air Division

Ustio Air Force 6th Air Division
66th Air Force Unit "GALM"

Ustio Air Force 6th Air Division
4th Air Force Unit "CROW"

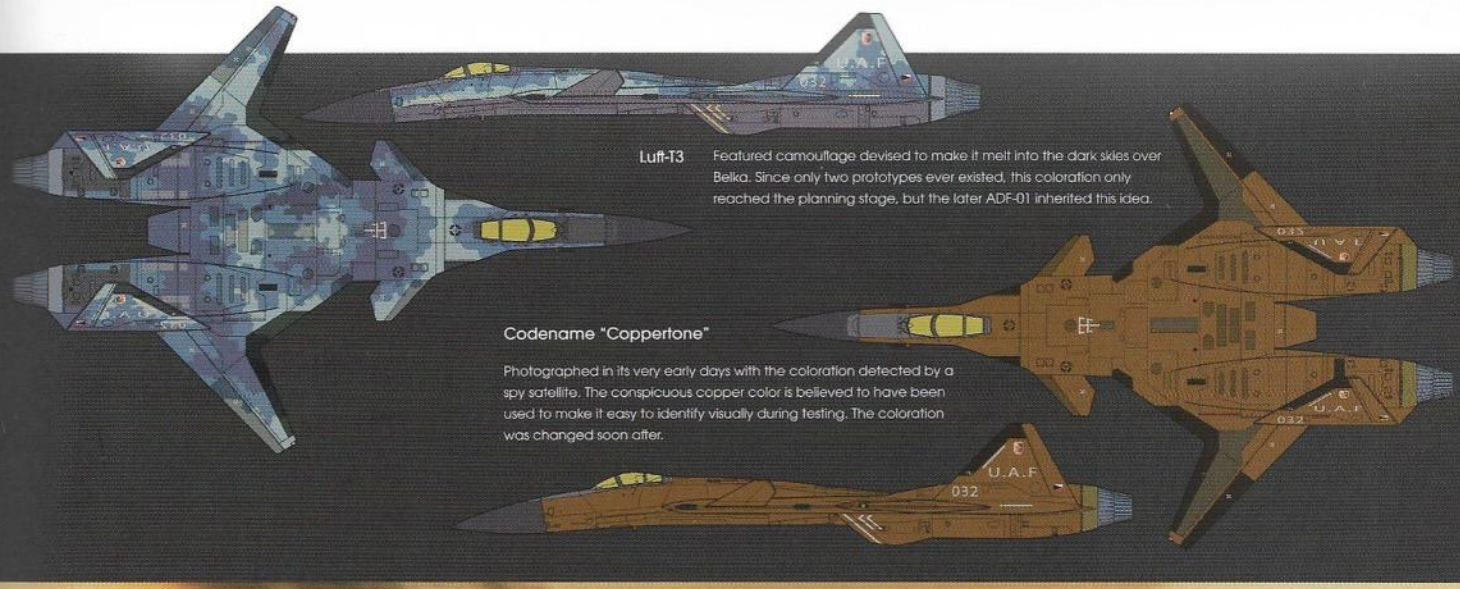
OSEA AIR FORCE UNITS INSIGNIA

Osea Air Defense Force 8th Air Division
32nd Tactical Fighter Squadron "WIZARD"

Osea Air Defense Force 8th Air Division
32nd Tactical Fighter Squadron "SORCERER"

USTIO AIR FORCE UNITS INSIGNIA

Sapin Air Force 9th Air and Land Division
11th Tactical Fighter Squadron "ESPADA"



Luft-T3 Featured camouflage devised to make it melt into the dark skies over Belka. Since only two prototypes ever existed, this coloration only reached the planning stage, but the later ADF-01 inherited this idea.

Codename "Coppertone"

Photographed in its very early days with the coloration detected by a spy satellite. The conspicuous copper color is believed to have been used to make it easy to identify visually during testing. The coloration was changed soon after.

Overview	Role	Air superiority/Multirole fighter/Prototype
	Crew	1 pilot
	Development launch	1/4/1985
	National origin	Principality of Belka (South Belka Munitions Factory)
	Length	23.9 m
	Width	13.7 m
	Height	5.7 m (When ground including landing gear), 4.6 m (landing gear retracted)
Weight	Plane only	19,600 kg
Propulsion	Engine	WWX-GD-401 (400 Series "WWX-GD-425 prototype engine)
Performance	Combat radius	1,200 km
	Max speed	Mach 2.0+
Weaponry	Fixed weapons	One GH. 30mm machine gun
	Missiles	Two self-defense short-range IIR missiles "LLS (Tactical Laser System) "Zenith" MPBM (Multi-Purpose Burst Missile) "Hypertherse" ECMP (Electronic Counter Measure Pod) "Morganite"
Other	Aerial refueling	Via the flying boom system
	Carrier compatible	No

USTIO AIR FORCE UNITS INSIGNIA

BELKAN AIR FORCE

Belkan Air Force 2nd Air Division
52nd Tactical Fighter Squadron "ROT"

Belkan Air Force 13th Night Fighter Air Division
6th Tactical Fighter Squadron "SCHWARZE"

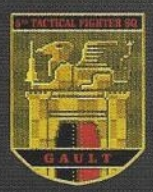
Belkan Air Force 10th Air Division
8th Tactical Fighter Squadron "GRUN"

Belkan Air Force 22nd Air Division
4th Tactical Fighter Squadron "SCHNEE"

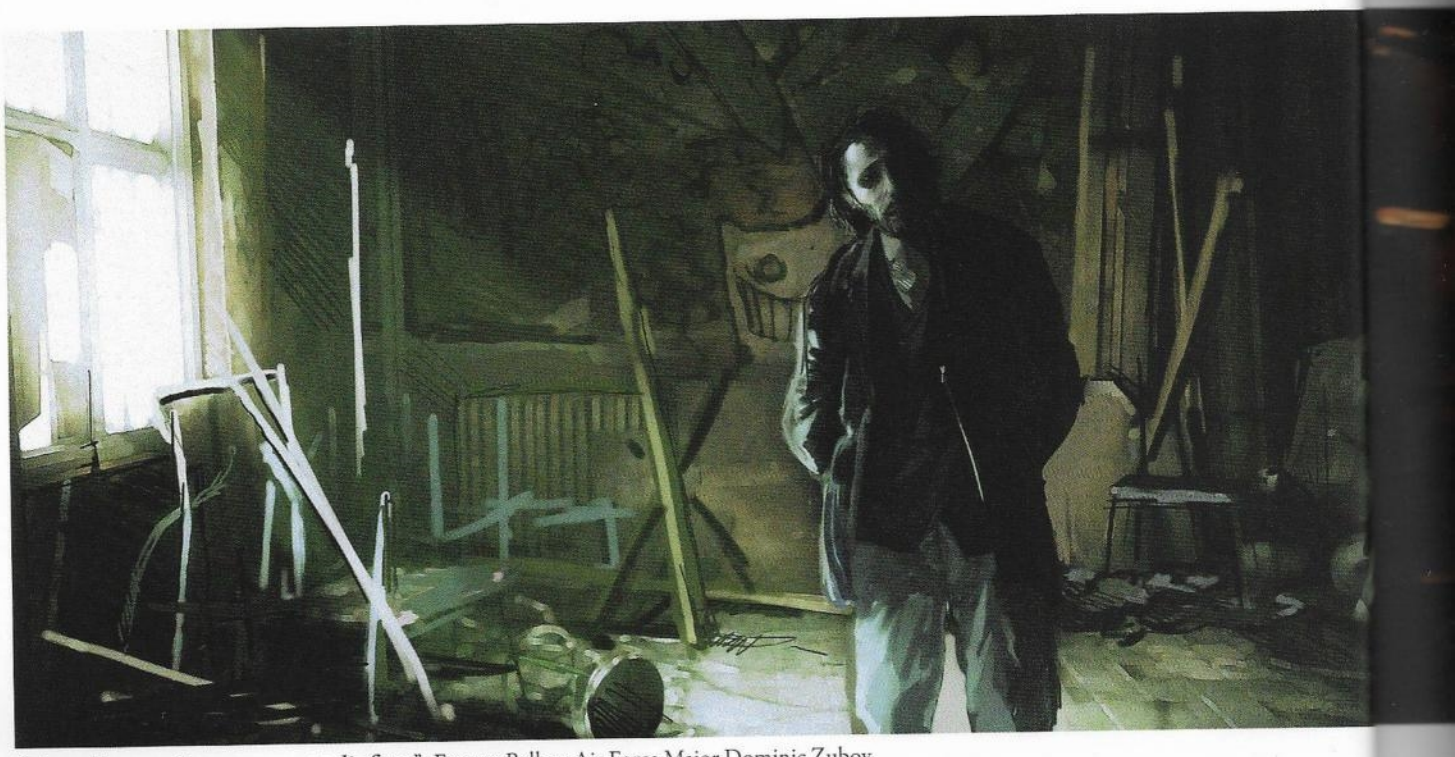
Belkan Air Force 7th Air Division
51st Tactical Fighter Squadron "INDIGO"

Belkan Air Force 51st Air Division
126th Tactical Fighter Squadron "SILBER"

Belkan Air Force 5th Air Division
23rd Tactical Fighter Squadron "GELB"



Belkan Air Force 18th Air Division
5th Tactical Fighter Squadron "GAULT"



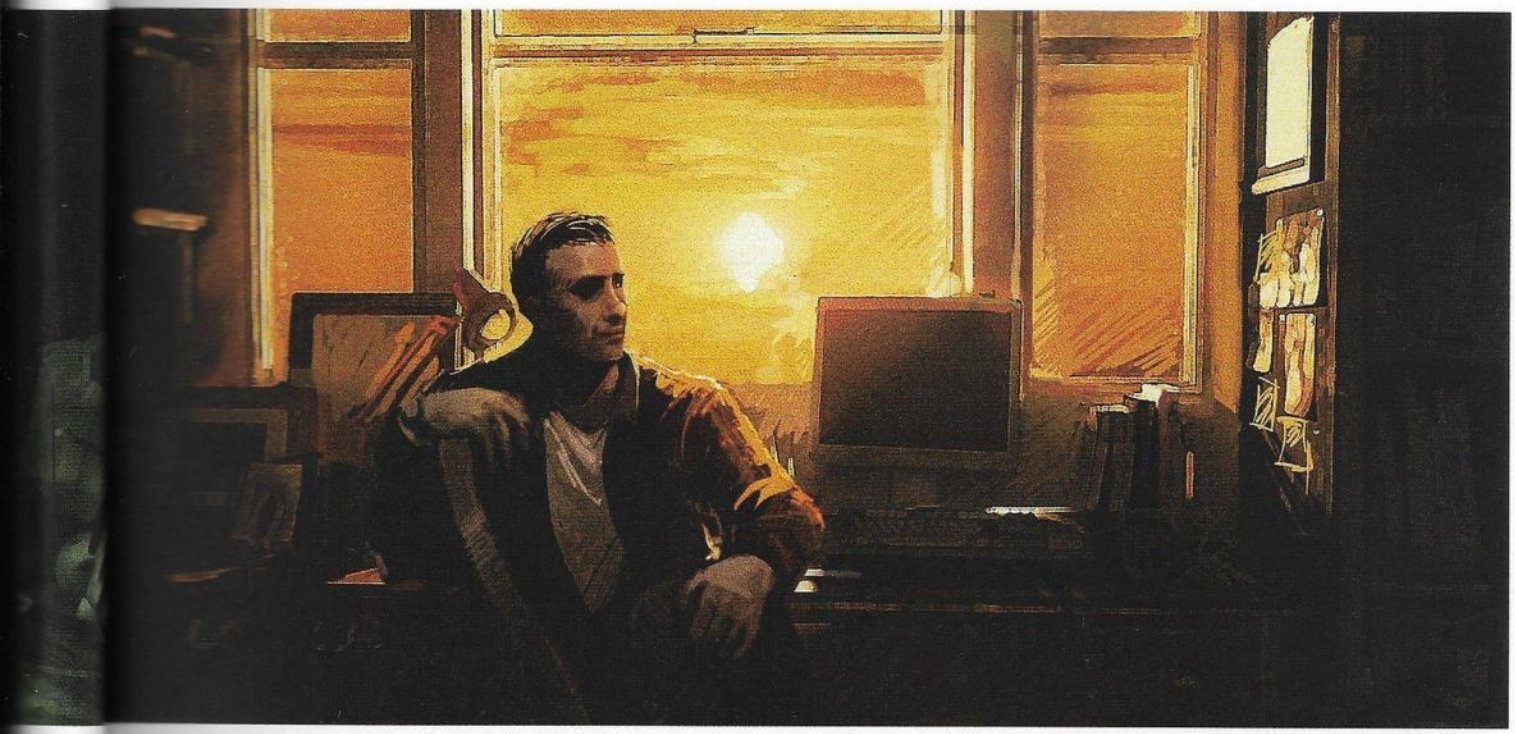
"The real heroes always manage to die first." -Former Belkan Air Force Major Dominic Zubov

OBC

From the OBC (Osean Broadcasting Company) documentary

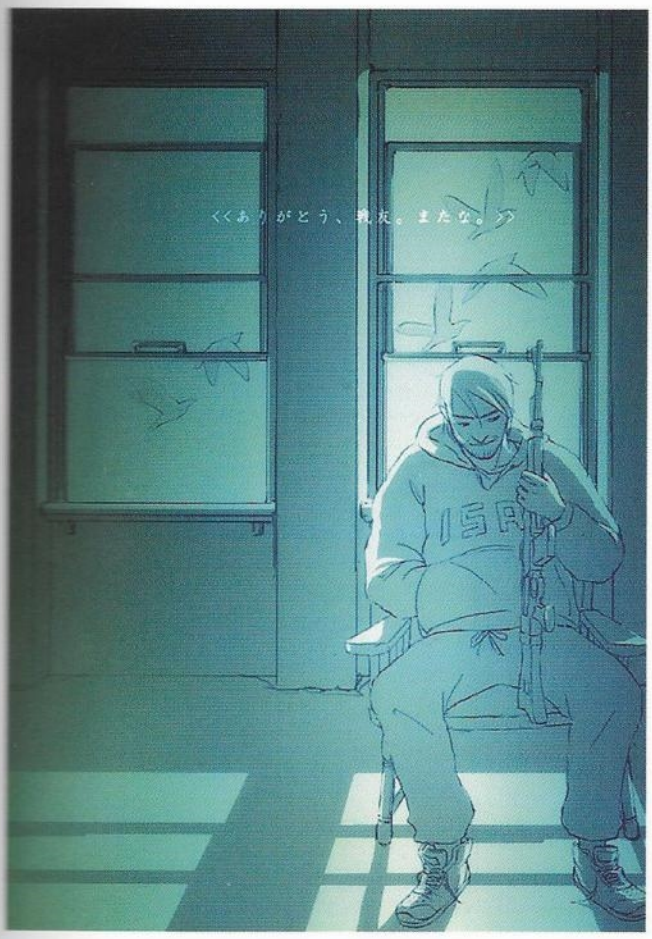
Warriors and the Belkan War

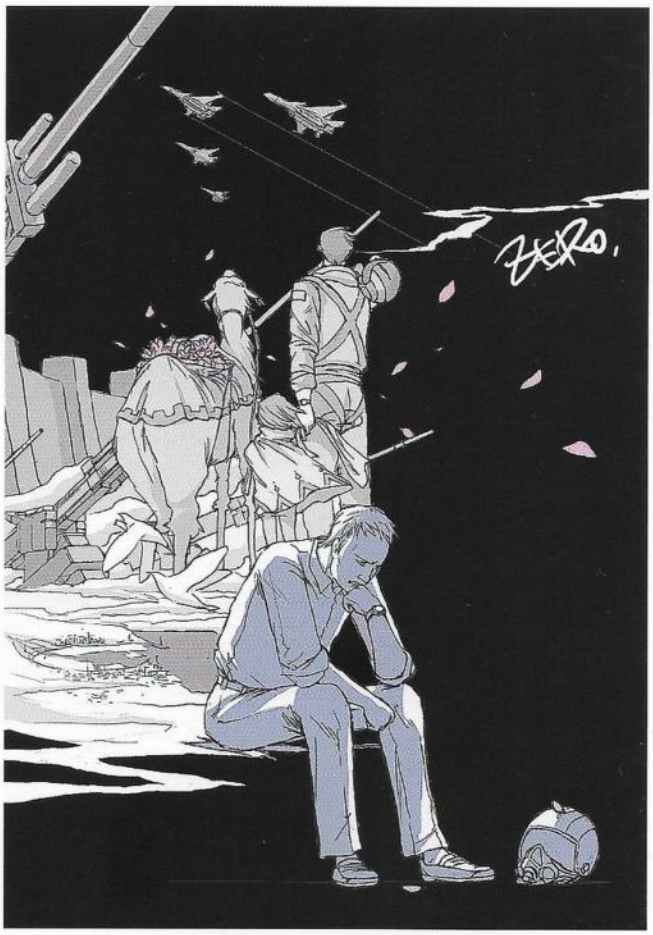
This Brett Thompson-produced and narrated documentary is highly acclaimed for its sweeping view of the Belkan War. Thompson draws viewers in through the exploits of a hero who helped lead the Allied Forces to victory only to never be heard from again. Known as Galm 1 or the Demon Lord of the Round Table, he was an ace pilot and mercenary hired by the Republic of Ustio. Thompson incorporates exciting footage, and while he is unable to fulfill his dream of meeting Galm 1, he succeeds in conducting a number of interviews with former pilots who had battled the hero, making this a precious resource documenting the Belkan War. The war begins on March 25, 1995 when Belka declares war on its neighbors in an effort to seize Ustio's natural resources. The Belkan forces are for all practical purposes routed by Galm 1 alone, and on June 20, an armistice is signed. On December 25, however, the rebel group A World With No Boundaries takes advantage of the chaos sewn by the war to launch a coup, even going as far as to plan the use of weapons of mass destruction. Galm 1 once again springs into action to restore peace. During the war and its aftermath, some of the aces from Belka and A World With No Boundaries experience an emptiness in their hearts, while others lose loved ones, but when they speak about Galm 1, whom they had battled against, Thompson says, "They all had a slight smile on their face." It was as if they had found a new lease on life through their encounter with an exceptional ace, despite the scars he left. That may very well symbolize the Belkan War itself.



"And the people were looking up to his plane high above the sky." -Former Belkan Air Force First Lieutenant Rainer Altman

THE BELKAN WAR 03.1995 – 12.1995





THE FEDERAL REPUBLIC OF ERUSEA

A militaristic country that boasts the greatest area on the continent of Usea. Its relations with its neighbors have been poor throughout history, and it has been in a state of tense, armed peace for some time. The fall of the asteroid Ulysses in 1999 caused unprecedented damage, and the nation was flooded with refugees, creating intense political pressure. This was channeled into invasions of neighboring countries that ended in ignoble defeat. Its capital is Farbanti.

THE INDEPENDENT STATES ALLIED FORCES (ISAF)

The Independent States Allied Forces (ISAF) was formed in 2003 to oppose the invasion of San Salvacion by the Federal Republic of Erusea. In the end, every nation in Usea other than San Salvacion and the Federal Republic of Erusea were members. They emerged victorious in the Continental War, partly due to the efforts of ace pilot Mobius 1.

Section #02

CONTINENTAL WAR

07.2003 – 09.2005

ASTEROID ULYSSES SHATTERS ARMED PEACE ERUSEA DRIVEN TO THE BRINK

Situated in the western region of the Usean continent, the Federal Republic of Erusea had long maintained a tense relationship, often referred to as an "armed peace," with nations on the eastern part of the continent, stemming from historical, geopolitical, and economic issues.

But this was to change on account of a press conference held on April 20, 1996 by the president of the Federation of Central Usea (FCU), which numbers among the nations on the continent. For the very first time, it was revealed to the public that the asteroid 1994XF04 Ulysses's collision with Earth was inevitable. The grim news stated that on July 1999, fragments of the asteroid would begin raining down over a broad swath of the planet, primarily the Usean continent. The resulting impacts would have the combined force of two million nuclear warheads. A nuclear winter was all but assured based on forecasts. The FCU's government had determined that international cooperation would be essential for defending against the asteroid and thus took the bold step of making this public announcement.

The FCU and its allies planned the development of Stonehenge, a complex of eight railguns defined as a 120 cm anti-air-and-surface, gunpowder-and-electromagnetic hybrid acceleration-based semi-automatic fixed-gun system, as a means to intercept and destroy the incoming asteroid fragments. The complex was built in San Salvacion, which is located in central Usea, but the region's history and political environment fueled a protest movement against it.

On July 8, 1999, Ulysses passed through Earth's Roche limit. Various measures were taken to destroy it, including the use of the Stonehenge railgun complex, but several large fragments made impact after failing to burn up in the atmosphere. In the first two weeks of the impact event, some 500,000 people lost their lives across Usea, and economic losses amounted to approximately 18 months worth of the continent's total GDP. This was followed by the dread of knowing that other fragments still in orbit would eventually come crashing down. The destruction also resulted in several million refugees across the continent, and the worsening refugee crisis would later be one of the factors that triggered the Continental War.

The smaller nations hoped to solve this crisis by forcing the much larger Erusea to accept more refugees, but in April 2000, Erusea tightened visa requirements in an effort to prevent further immigration. This act, along with the continent's other countries' foisting of refugees on Erusea, prompted global condemnation.

As the crisis worsened, the Erusean government sought to resolve it by a military invasion of the Usean nations that had been pressing it to accept more refugees. In the summer of 2003, four years after the Ulysses Impact Event began, Erusea invaded San Salvacion. An aerial bombardment by the Erusean Air Force was followed by a three-day ground offensive that swiftly captured the nation's capital, also known as San Salvacion. The aerial forces tasked with defending Stonehenge, which were under the command of the Central Usea Treaty Organization (UTO), were destroyed, and the complex was taken along with the staff who operated it. As a result, Erusea took control of the skies across the entire continent.

The leaders of the FCU and other nations across the continent denounced Erusea's actions. The FCU's president formed the 11-nation Continental Nations' Economic Alliance, and later the Independent States Allied Forces (ISAF) consisting of 16 member states.

The ISAF immediately launched a counteroffensive, but Erusea began using Stonehenge as an anti-aircraft weapon, thereby decimating ISAF air power and securing air supremacy. Unable to obtain air support, the ISAF's ground forces were defeated time and time again by the Erusean Army, pushing the frontline ever eastward. A plan to attack Stonehenge was hatched after the ISAF was forced to retreat to Los Canas in the eastern part of the continent. A special ISAF attack squadron consisting of twelve F-15Es with full bomb payloads and twelve F-15Cs tasked with air combat was dispatched only to be intercepted by five enemy fighters that proceeded to wipe out the entire squadron with minimal resistance. These fighters belonged to the 156th Tactical Fighter Wing "Aquila" Squadron, which the Erusean Air Force had formed to defend Stonehenge. They were also known as Yellow Squadron among both the ISAF and Erusea, and they became a terrifying adversary for the former. Los Canas fell several days after this defeat. The ISAF's retreat continued even after pulling out of Los Canas, until it was finally forced out of Stonehenge's firing range. As a result, the decision was made to withdraw from the continent for the relative safety of the islands to the east. The ISAF established its new general headquarters in North Point, an island nation northeast of the Usean continent. Although the new headquarters was protected by a radar network, it was weak in terms of anti-aircraft firepower, resulting in a base that could only be described as a paper tiger.

Erusea seized Rigley Airfield in the northeastern part of the continent in a bid to put a nail in the ISAF's coffin. The airfield was converted into a military airbase, and a large number of Tu-95s were deployed to bomb North Point into submission. In addition, the Erusean Navy dispatched its Aegir Fleet along with its flagship, the battleship Tanager, to Comberth Harbor in the eastern part of the continent, and plans proceeded for the attack and occupation of North Point.

On September 19, 2004, Erusean operatives destroyed part of the ISAF's radar network. In conjunction with this operation, a bomber squadron and its escorts took off from Rigley Air Base and headed for Newfield Island. After bombing Newfield Island's urban areas and Allenfort Air Base, the squadron had planned on bombing North Point as well, but the nation was spared after the ISAF Air Force's hastily scrambled fighter squadron shot down every last enemy plane.

On October 5, the ISAF launched a successful air assault to take back Rigley Air Base, which numbered among its existential threats as long as it remained in enemy hands. This was followed by the ISAF's October 10 destruction of the radar facility at the top of Mount Shezna, which had been supporting Erusea's air strikes. This succeeded in weakening the Erusean air defense network.

On November 7, after learning that the Aegir Fleet was anchored in Comberth Harbor, the ISAF attacked an aerial transport squadron northwest of the harbor. This was followed by ISAF's November 19 air strike on Comberth Harbor itself, along with the petrochemical complex that had been refueling the Aegir Fleet. The attack was a success, dealing extensive damage to the complex, but the ISAF also sustained heavy losses after its aircraft were intercepted by Aquila Squadron in response to the Erusean Army's call for backup. On November 23, the ISAF launched a surprise attack against the Aegir Fleet anchored in Comberth Harbor. This was the ISAF's first large-scale air offensive since moving its headquarters to North Point, but it ended up being a major victory, especially considering the fact that the battleship Tanager, the Aegir Fleet's flagship, and many other vessels were sunk. This caused the Erusean Army to indefinitely suspend its planned invasion of North Point.

In preparation for its mainland counteroffensive, on December 16, the ISAF conducted a successful aerial bombardment against a solar power generation complex in the Faith Park region located in eastern Usea. However, the operation brought its aircraft within Stonehenge's firing range, resulting in a significant number of casualties. To further prepare for its mainland counteroffensive, the ISAF was readying the launch of a spy satellite from a launch site in the Comona Islands when Erusea got wind of it. Erusea deployed a massive aerial force, and on December 31, the largest air battle in history was waged, with a combined total of over 200 aircraft taking part on both sides. During the battle, the ISAF Air Force's mixed air squadron struck back at Aquila Squadron, which had inflicted heavy losses on the ISAF. One of the five Aquila Squadron planes was damaged to the point of being unable to continue the fight, and as a result, the squadron withdrew. Thanks to this, the launch site was successfully defended, and the spy satellite was launched without incident.

Having completed its preparations for the counteroffensive, on January 24, 2005, the ISAF landed forces on the Halle, Crowne, and Caranda beaches in southeastern Usea, thereby establishing a beachhead. On February 28, the ISAF launched an air strike against Istas Fortress on the Tango Line, the Erusean Army's main defensive line in the eastern part of the continent, overrunning all enemy positions therein. This was followed by the ISAF occupation of Los Canas where they established a frontline command post to serve as a staging point for incursions deeper into the continent and an attack on Stonehenge.

On March 14, engineers who had helped develop Stonehenge under the supervision of Erusean authorities escaped from San Salvacion with their families in two commercial airplanes in a bid to seek asylum in an ISAF member nation. The ISAF's 118th Tactical Fighter Wing, which had been dispatched to escort them, successfully fought off the Erusean Air Force's pursuit. Both commercial aircraft safely delivered the defectors to freedom. On April 2, the ISAF concluded that, based on intel provided by the engineers who had defected, a small fighter squadron with excellent maneuverability could get close enough to Stonehenge to launch an attack. This marked the second time since the start of the war that they would mount an attack against the superweapon. Using a mixed air squadron, the ISAF Air Force managed to destroy Stonehenge. Aquila Squadron arrived too late, and in the ensuing air battle, the lead plane in the mixed air squadron (call sign: Mobius 1) shot down Aquila Squadron's second plane, resulting in the death of its pilot, Yellow 4. After the battle, Mobius 1 became a symbol of fear among Erusean forces, and FCU media reports of Stonehenge's destruction gave a dramatic boost to ISAF morale.

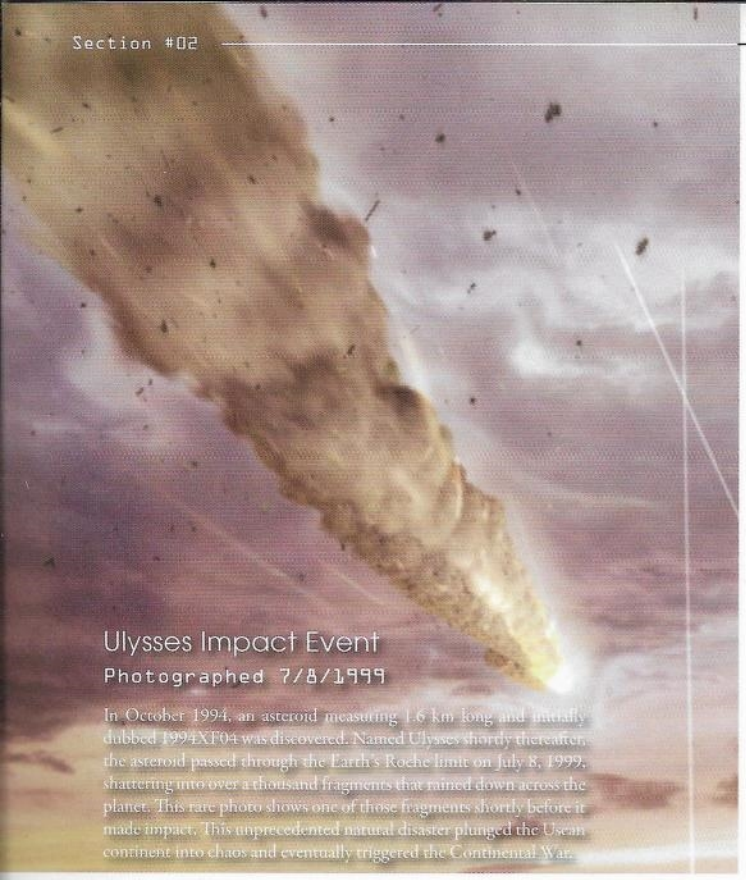
On May 7, a U-2 spy plane returned from a reconnaissance mission in Erusean airspace with intel on the Megalith superweapon. The ISAF set its sights on ending the war before Megalith could be tactically deployed. On June 18, the ISAF commenced another landing operation, this time on the continent's northern coast, which had previously been within range of Stonehenge.

In response, Erusean forces launched cruise missile attacks from XB-70 supersonic bombers, but the ISAF Air Force's planes shot down every last one of the attacking aircraft. As a result, the landing force was able to secure the northern coast. At midnight on July 10, the ISAF sent ground and air units into San Salvacion with help from the local resistance. The resistance ended the Erusean-imposed blackout, and a battle commenced between the two sides. Facing superior numbers, the Erusean Air Force resorted to scorched-earth tactics using a Tu-160 squadron, but all its planes were shot down in an air battle with the ISAF Air Force.

This resulted in the withdrawal of Erusean forces from San Salvacion, marking the end of the nearly two-year occupation.

On August 15, Erusea decided on the western part of Whiskey Corridor as its last line of defense. A tank corps was deployed as the heart of the defensive force, but the ISAF launched a decisive operation to break through, requesting air support with an eye on taking Farbanti. In the ensuing battle, Erusea lost countless tanks and had to abandon its defensive line. On September 19, the ISAF commenced entry into the Erusean capital of Farbanti via the Silver Bridge to the east and the flooded district to the south. Erusean forces mounted a stiff resistance, even deploying battleships in the fray, but the destruction of Johnson Memorial Bridge effectively divided them in two. As the Erusean Army General Headquarters was overrun and the battle was drawing to a close, Aquila Squadron arrived over Farbanti. All of its planes were shot down in the ensuing air battle with the ISAF, and the squadron's captain, Yellow 13, was killed in action. The battle to take the city was over. Afterwards, Erusea agreed to the ISAF's terms of surrender.

On September 26, young Erusean military officers opposing the surrender seized Megalith. When they began using its missiles to redirect fragments of the asteroid Ulysses to crash to Earth, the ISAF responded by sending an air squadron to attack from above and an assault team to breach the facility from the ground to destroy it. An air battle unfolded between the ISAF Air Force's 118th Tactical Fighter Wing, "Mobius," and a squadron of young Erusean Air Force pilots devoted to Aquila Squadron. Within the Megalith facility, close-quarters combat ensued between the ISAF's assault team and the occupying Erusean force. Following the air battle, Mobius 1 flew into the central silo to destroy the large missile within. At the same time, the assault team opened the mouth of the missile silo to allow Mobius 1 to escape. This strike ended Megalith's ability to redirect Ulysses fragments against ground targets.



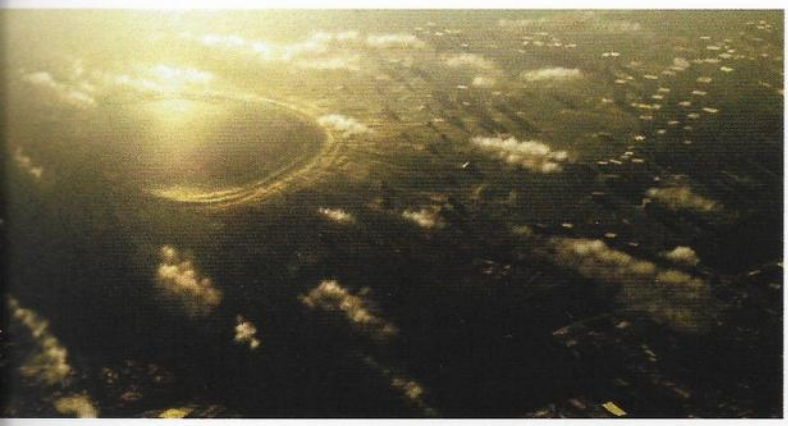
Ulysses Impact Event

Photographed 7/8/1999

In October 1994, an asteroid measuring 1.6 km long and initially dubbed 1994XF04 was discovered. Named Ulysses shortly thereafter, the asteroid passed through the Earth's Roche limit on July 8, 1999, shattering into over a thousand fragments that rained down across the planet. This rare photo shows one of those fragments shortly before it made impact. This unprecedented natural disaster plunged the Usean continent into chaos and eventually triggered the Continental War.

Laker Crater

The secondary disaster triggered by the asteroid fragment that fell here is more famous than the crater itself. The impact resulted in a massive crustal deformation over a large area of land that was already weak, causing the coast of Farbanti, the capital of Erusea, to sink below the ocean. Despite this devastation, Erusea did not move its seat of government, and Farbanti has, therefore, remained the nation's capital. Since Laker Crater was formed on the seafloor, it has eroded far more than the other craters. Given enough time, all traces of it will eventually vanish.



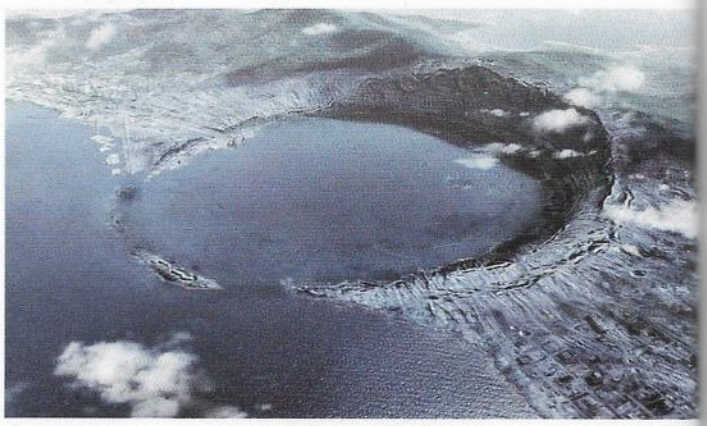
Goldberg Crater

With a diameter of some 8.4 km, the Goldberg Crater is one of the largest created by Ulysses. Despite being caused by a massive fragment of the asteroid, scientists believe that by striking a desert region, its impact energy was somewhat weakened, thereby preventing the crater from being even larger. Ground water can be seen seeping up from the middle of this deep scar that has been gouged in the earth, but it is forecasted to run dry in the not too distant future, just like the Irsali River, which used to flow from east to west.

Anderson Crater

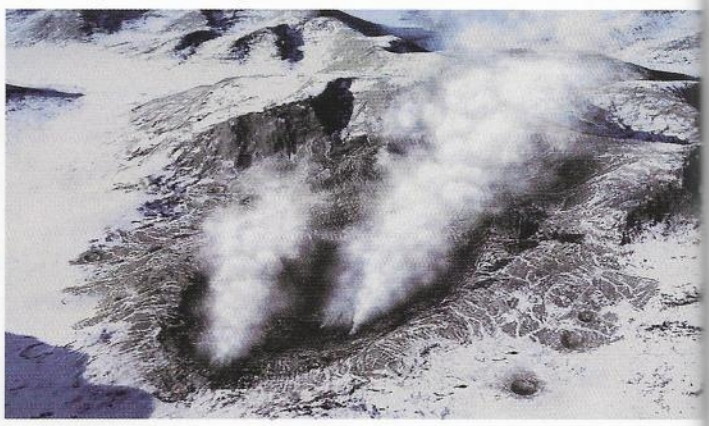
Photographed 9/19/2004

This infamous crater was formed on Newfield Island's east coast about 100 km south of North Point. The asteroid fragment struck the eastern part of the island, devastating the surrounding area. The damage would have been far worse if not for the mountain range that bisects the island from north to south. This acted as a shield that largely spared the western side. In recent years, there have been calls to fill the crater and rebuild the east side of the island, but the chaos of war still casts its shadow, making it difficult to proceed. Furthermore, the geological society that is studying the crater is mounting a protest against filling it in, further delaying any hope of rebuilding the area.



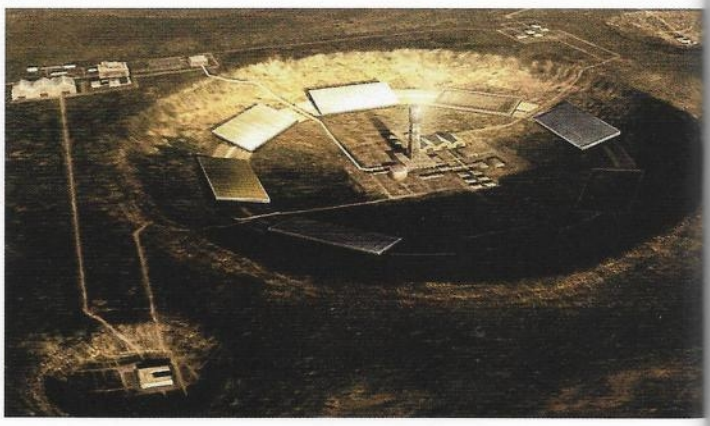
Krasinsky Crater

Even the beautiful and majestic Mt. Shezna bears the scars of the asteroid Ulysses. Named after the astronomer Dr. Romanov Krasinsky, the crater is 1.7 km in diameter. The asteroid fragment that fell here struck the mountain before its final impact, but that did little to reduce its power. The impact left a long scar across the foot of the mountain that looks like the earth had been ripped open. Furthermore, the heat generated by the impact melted the surrounding hard, recrystallized snow that had accumulated over countless seasons. To this day, water vapor can be seen rising from the center of the crater.



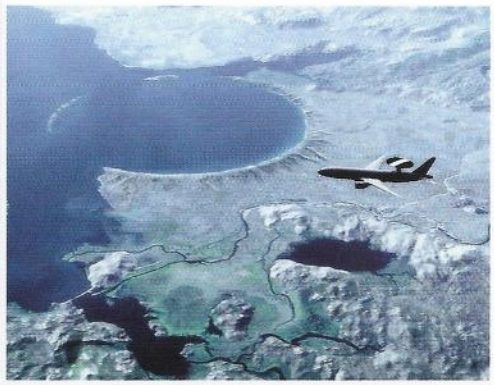
Mackenzie Crater

Located in the Faith Park region, the Mackenzie Crater was formed on a mesa. Researchers believe it will last for tens of thousands of years because the extremely low rainfall in the region means there will be virtually no water-based erosion compared to the other craters. The region is also notable as a stable source of solar power thanks to its proximity to the equator, which means long daylight hours year round. As such, a large number of solar panels have been installed there. A pilot plant using the solar power tower method is now being built in the crater.



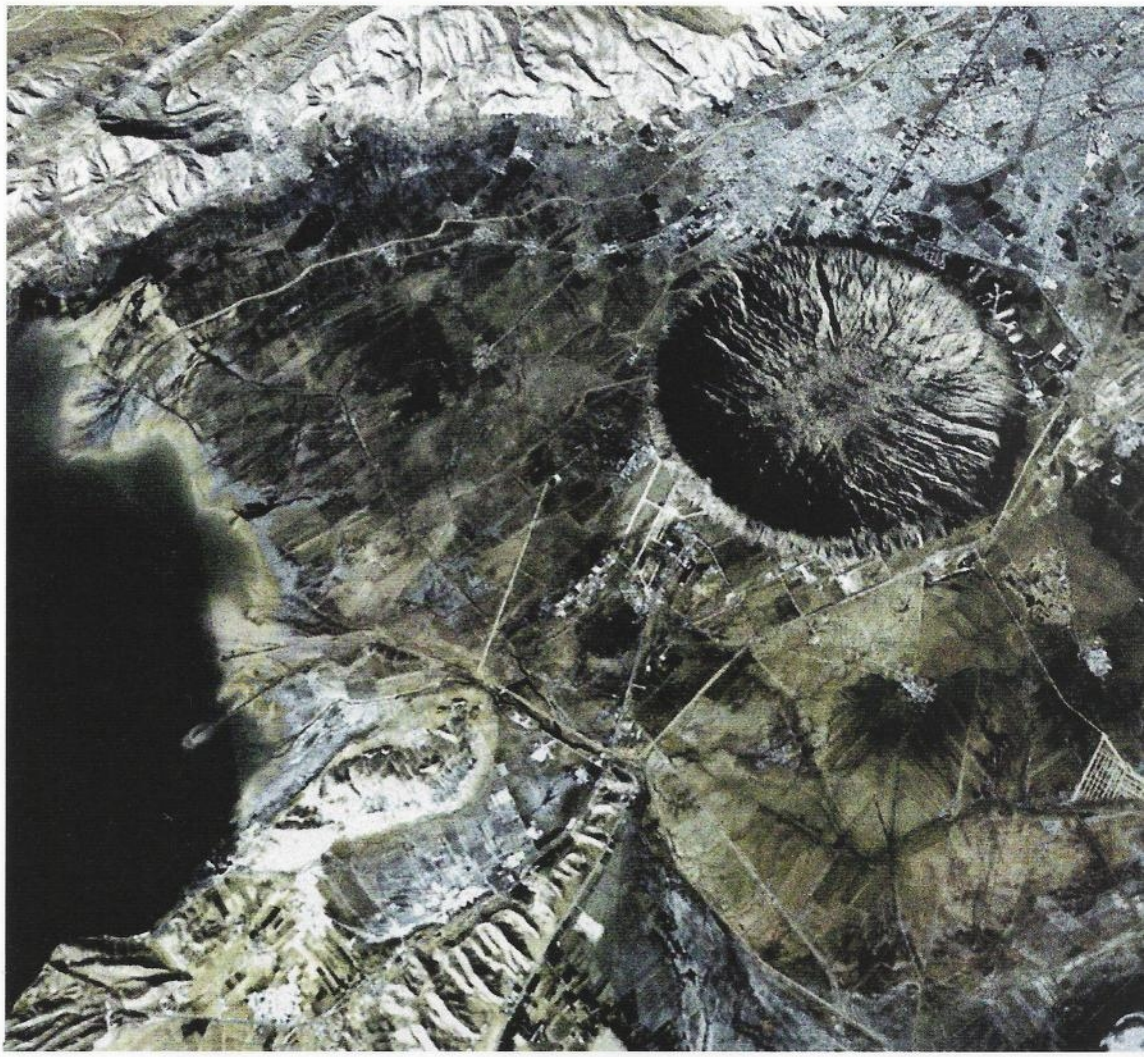
Newfield Island

Newfield Island lies southwest of North Point, a small island nation located off the northeast coast of Usea. Despite being rather small, Newfield is known worldwide as the site of the Anderson Crater. The island is distinguished by a mountain range that cuts across it from north to south. Allenfort Air Base lies on its northernmost point. Its inhabitants built a city on the southeast coast, but its urban area is now separated into north and south sections by the crater, and this is proving to be a major impediment to reconstruction.



CONTINENTAL WAR

07.2003 – 09.2005



This crater measuring nearly five km in diameter was formed in northern Usea on the outskirts of Saint Ark. Of all the Ulysses fragments to strike urban areas, this one was the most devastating. The port located in the southeast of the city was spared, but the air base was destroyed. The city's main thoroughfares were blocked by the debris generated by the impact event, and the majority of its civil defense capabilities were lost.

Reconstruction and redevelopment projects headed by a private consortium are now proceeding at a much faster pace than elsewhere, which has attracted the attention of other nations.

Bird's-Eye View of Stonehenge

Photographed 1/15/1999

Stonehenge as it neared completion six months before the asteroid Ulysses was to arrive. The complex consists of concrete slabs arrayed in a circular pattern with the railguns on the inner ring and control facilities and bunkers on the outer ring. It was believed to have been laid out in this fashion to function as a defensive wall against enemy attacks. This points to the foresight early on that this facility, on which the fate of humanity rested, might come under attack by others who felt they knew how to make the best use of it.

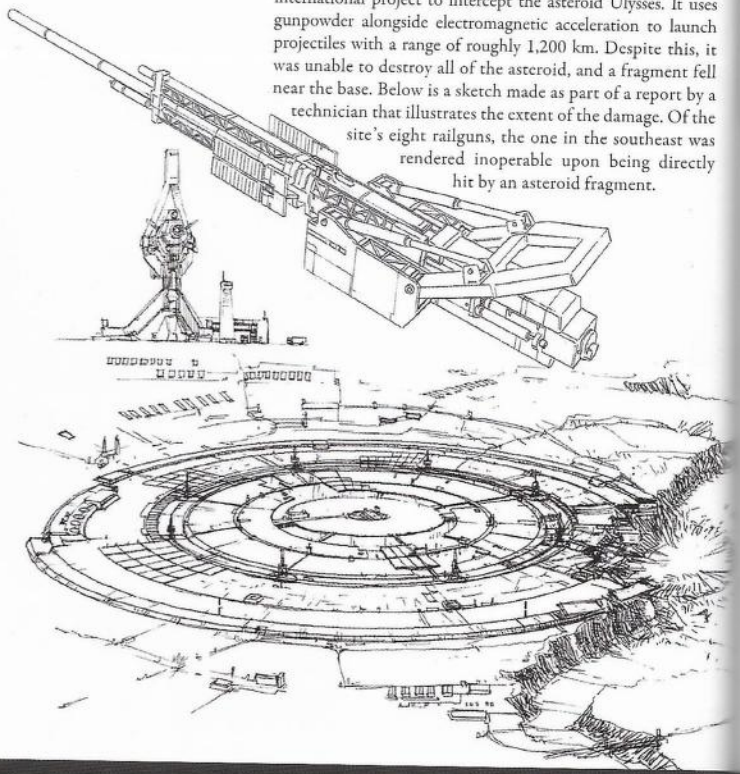
Stonehenge Under Construction

Photographed 9/13/1998

On April 20, 1996, the FCU's president publicly announced that the asteroid Ulysses's collision with Earth was inevitable. But by that time, the Stonehenge project is said to have already been secretly underway. Engineers and construction firms from the world over came together, working at a fevered pitch.

Stonehenge

Stonehenge is the name of eight supersized anti-air railguns and the base that allows their operation. It was developed as an international project to intercept the asteroid Ulysses. It uses gunpowder alongside electromagnetic acceleration to launch projectiles with a range of roughly 1,200 km. Despite this, it was unable to destroy all of the asteroid, and a fragment fell near the base. Below is a sketch made as part of a report by a technician that illustrates the extent of the damage. Of the site's eight railguns, the one in the southeast was rendered inoperable upon being directly hit by an asteroid fragment.



ISAF UNITS INSIGNIA

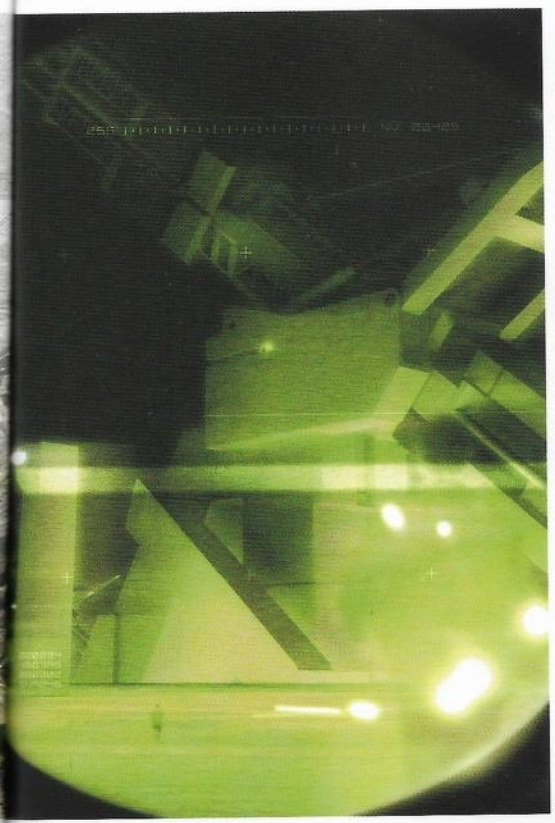
ISAF AirForce 118th Tactical Fighter Wing Squadron "Mobius"

ISAF DIVISION MARK

ISAF Army
Division 032 Mark

ISAF Navy
Division 012 Mark

ISAF Airforce
Division 425 Mark



After Erusean forces captured the Stonehenge railgun complex to use against its enemies, the Independent State Allied Forces (ISAF) executed a covert infiltration operation. This image was captured at that time. However, the side lobe radiation generated while transmitting the image data was detected, and the ISAF's sabotage operation failed. Information about the date, location, and fate of the personnel who took part in the operation has never been revealed.

This photo shows two Erusean Air Force fighters tasked with defending Stonehenge. The defense system for the captured Stonehenge railgun complex was a bit complicated. It consisted of the railguns themselves, the Missile Air Defense Force for short-range defense, and the Erusean Air Force for defending the surrounding area.

Erusea's Missile Air Defense Force was originally a division within the Erusean Air Force known as the Missile Air Defense Division where demoted officers were sent into de facto exile. But after Stonehenge was captured during the Erusean offensive, it was upgraded into a separate branch of the nation's military. Grudges held by officers demoted from the air force and governmental red tape had immobilized the functions of both groups.

The deciding moment was when an air force plane was shot down by Stonehenge. It was determined that too much overlap between the two had contributed to the accident, and as a result, there was a massive cutback in air force squadrons stationed at Stonehenge. A portion of the elite force possessing unmatched skill had formed the core of the air defense, but due to severe turnover among their ranks, their defensive capabilities were not as bulletproof as they trumpeted to other nations.

CONTINENTAL WAR
07.2003 – 09.2005

ERUSEA AIR FORCE UNITS INSIGNIA

Erusea Air Force 156th Tactical Fighter Wing Aquila Squadron
"Yellow Squadron"

ERUSEA ARMY etc.

ERUSEA Army Mark

ERUSEA Army
"Stonehenge" Mark

ERUSEA Army "Stonehenge" Mark
"SHOOTING STAR SQUADRIN"

ERUSEA Army Division Mark

X-02A Wyvern

This navy/air force fighter plane was developed by Erusea. Its variable-wing design allows it to switch between stealth and combat modes. Since it was developed late in the fifth-generation fighter cycle, it was designed with counter-stealth capabilities in mind. The gallium nitride AESA radar equipped in its nose is far more powerful than conventional AESA radar, enabling it to detect enemy stealth aircraft by brute force. It also has conformal array radar equipped throughout the fuselage. This means that even if ally radar waves are deflected in a different direction by enemy stealth aircraft, other X-02As can pick them up, thereby functioning as a multistatic radar that triangulates enemy positions.

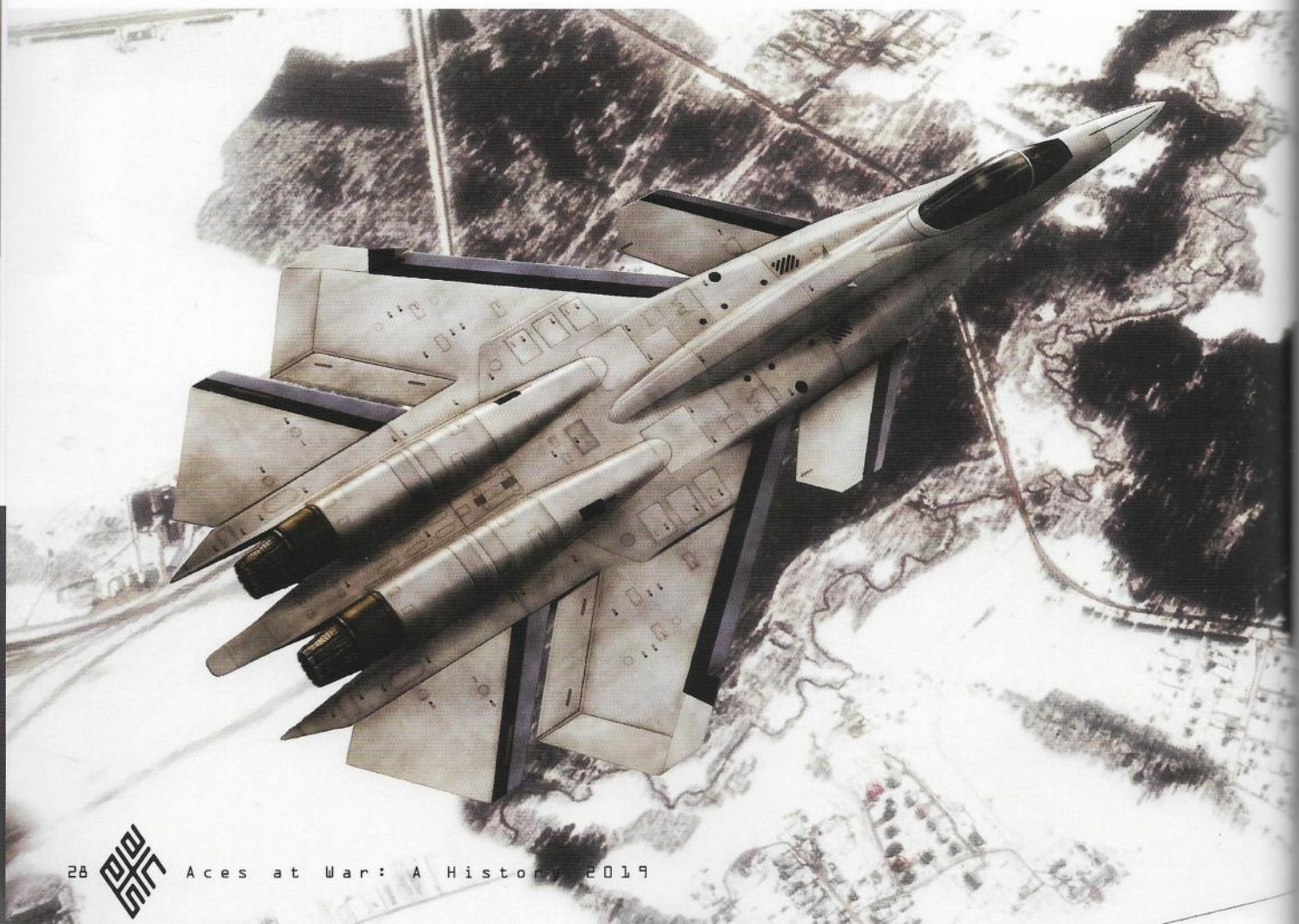
This plane is equipped with vectored thrust nozzles on a test basis, but they have not been incorporated into the actual system. As can be seen by the ventral fins installed around the engines, there is room for improvement in the flight system. Having them fully integrated would result in a more polished design.

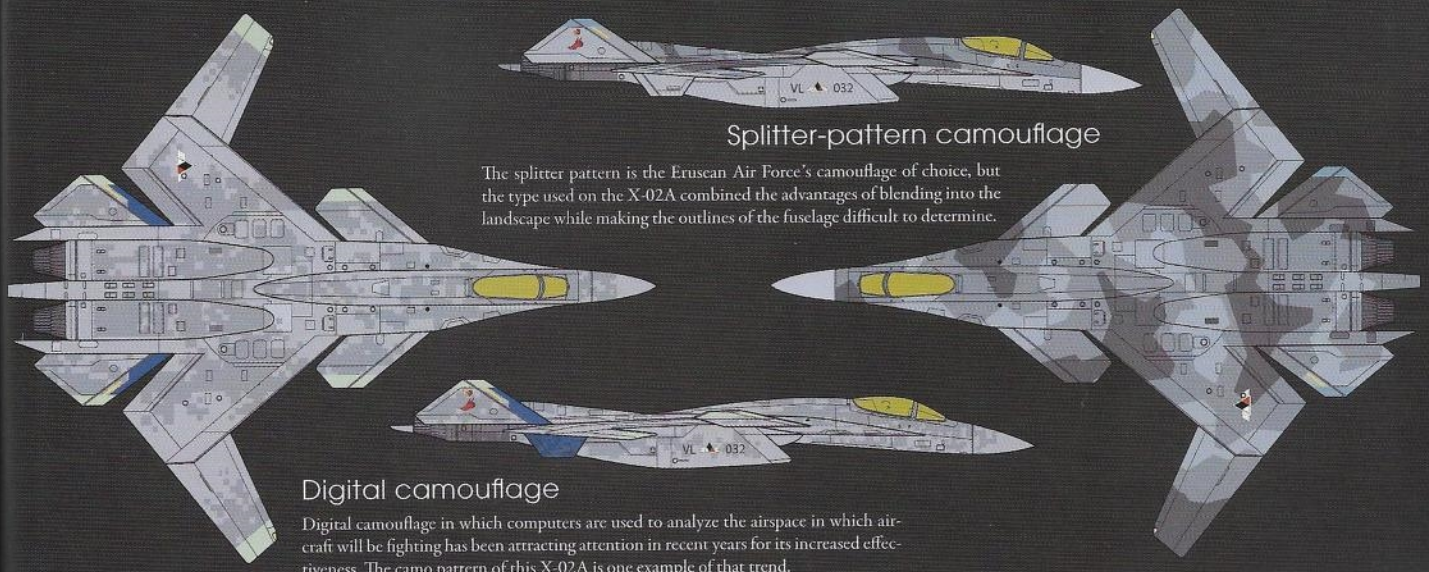
The most distinctive feature of the X-02A Wyvern is its unique variable wing structure. At low speeds, the main wings adopt a forward-swept configuration, allowing it to deliver unparalleled combat capabilities. At speeds around 700 km or more, however, the forward-swept wings fold inward, resulting in a back-swept configuration ideal for high-speed flight and advanced stealth capabilities. The two wing configurations looked so different that the ISAF mistakenly reported that Erusea was conducting comparative testing on two new aircraft. The lack of fuel tanks on the main wings was considered a shortcoming because it limits the amount of fuel the aircraft could carry.

The X-02A Wyvern employed a nearly seamless process that minimized skin seams, and it had a stealth coating with advanced radar-wave absorption performance and exceptional durability. It could be armed with Dark Fire long-range air-to-air missiles with a range of 200 km and AIM-9X short-range air-to-air missiles, but stealth pilots have pointed out that this left much to be desired in terms of air-to-ground weaponry. Nevertheless, the latest electronic equipment, including a piloting system and fire control system, were fully integrated, resulting in an aircraft with all-around combat capabilities above and beyond conventional warplanes.

The X-02A Wyvern's development history was far from ordinary. Around the time of the Continental War, Erusean weaponry was comprised primarily of arms from the East, and many military analysts have noted how that appears to have had an impact on the X-02A's design. Actual development is believed to have commenced around 1998. At the time, it was thought to have been a carrier-based plane for the navy, but the air force also wanted a new fighter, which led to the X-02A being developed as an air superiority fighter for both military branches.

However, after Erusean forces captured Stonehenge, a military faction emerged in the summer of 2003 that questioned the massive cost of developing a new fighter. The pro and anti-X-02A factions butted heads until development came to a virtual standstill. Following the fall of Stonehenge on April 2, 2005, Erusean forces were suddenly outnumbered, which led to the official decision to resume X-02A development. Unfortunately, development did not proceed as planned due to insufficient funding and materials, and the war came to a close right before it was completed.





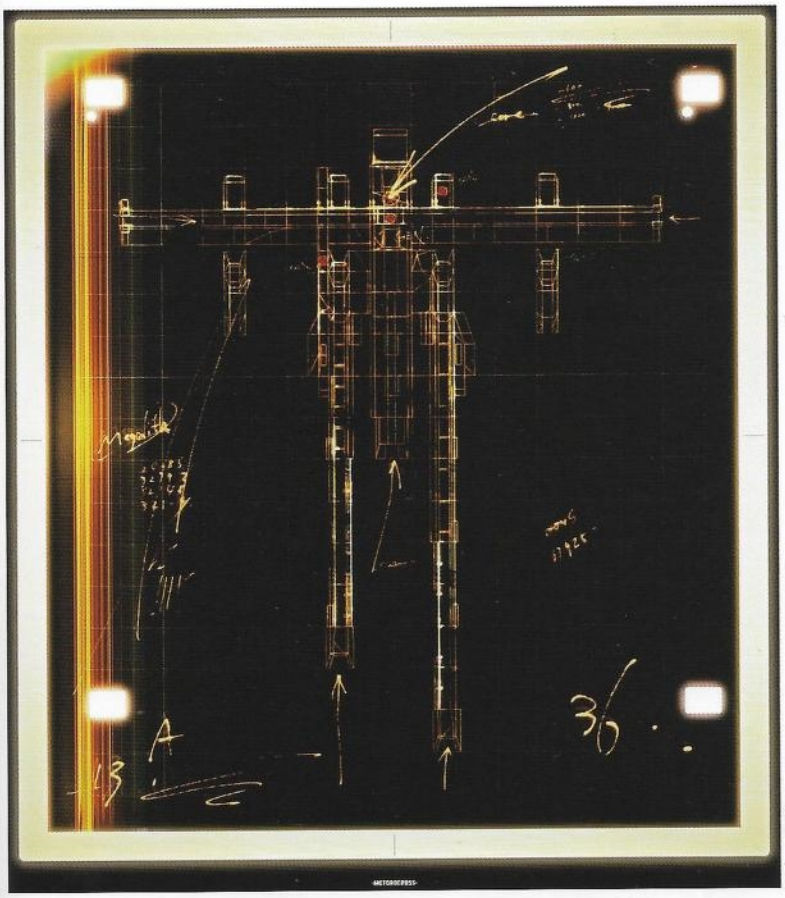
Splitter-pattern camouflage

The splitter pattern is the Erusean Air Force's camouflage of choice, but the type used on the X-02A combined the advantages of blending into the landscape while making the outlines of the fuselage difficult to determine.

Digital camouflage

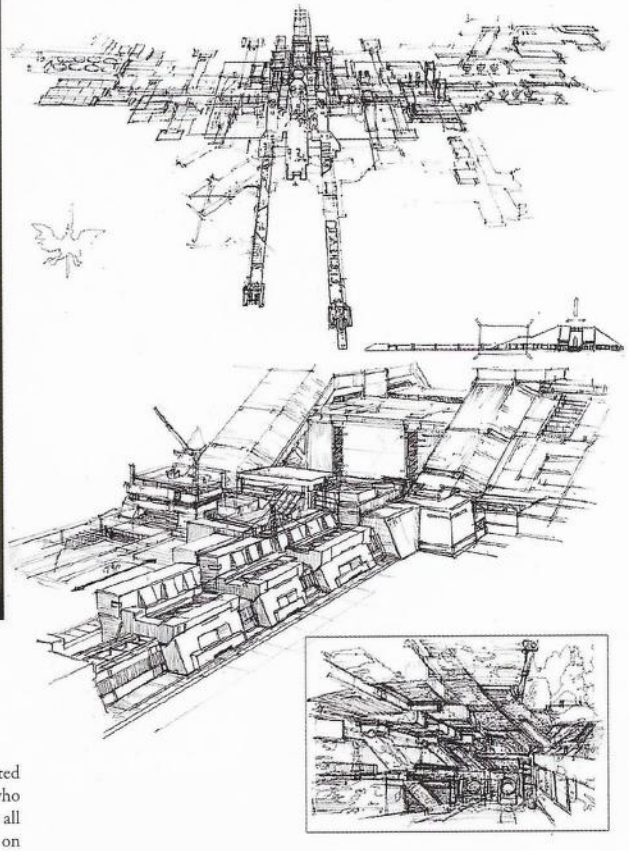
Digital camouflage in which computers are used to analyze the airspace in which aircraft will be fighting has been attracting attention in recent years for its increased effectiveness. The camo pattern of this X-02A is one example of that trend.

Overview	Role	Air superiority/Multirole fighter
	Crew	1 pilot
	Development launch	Sometime in 1998
	National origin	Federal Republic of Erusea
Dimensions	Length	21.84 m
	Wingspan	18.3 m (with outer wings deployed)/11.54 m (with outer wings stowed)
	Height	4.36 m (with outer wings deployed)/3.42 m (with outer wings stowed)
Weight	Plane only	16,800 kg
Propulsion	Engines	Two ERG-1000s
Performance	Combat radius	1,050 km
	Max speed	Mach 2.5+
Weaponry	Fixed weapons	One anti-air machine gun
	Bombs	Conventional unguided bombs
		Bomblet dispenser
	Missiles	AIM-9X Sidewinders
		R-73 Archers
		Dark Fire long-range air-to-air missiles (AAM)
		High-performance air-to-ground missiles
Other	Aerial refueling	Via the flying boom system
	Carrier compatible	Yes



Megalith

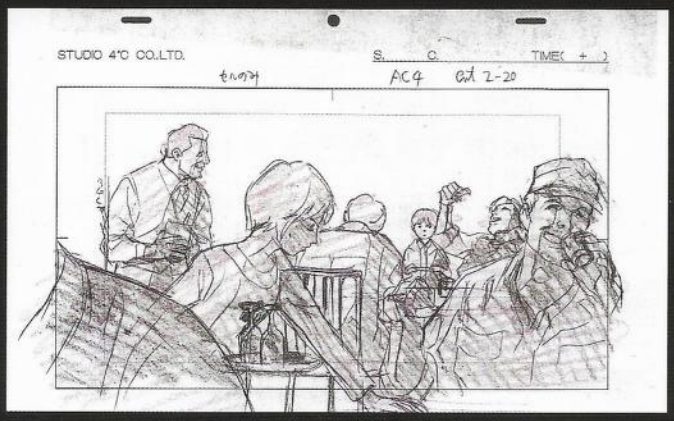
This military facility, the Erusean Army's ultimate weapon, was built on the Twinkle Islands, an island chain south of Erusea's capital of Farbanti. Its name will live in infamy as Erusea's last attempt at resistance when a group of young officers who did not agree with their nation's surrender holed up there following the capitulation of all the other Erusean forces. In addition to being a massive missile launch facility, it was also a unique weapon that could redirect asteroid fragments that were still in orbit, causing them to fall to Earth.

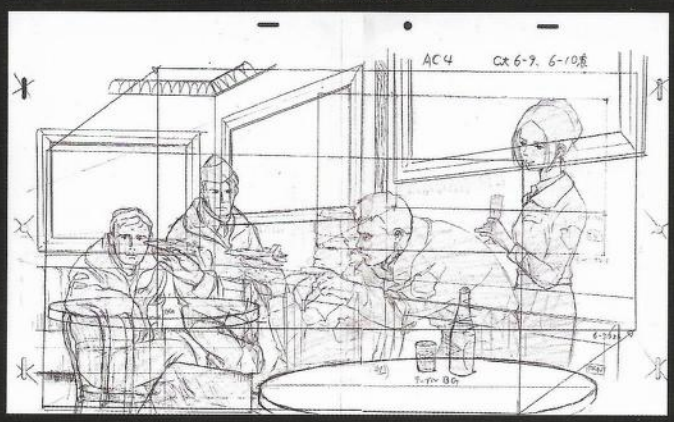


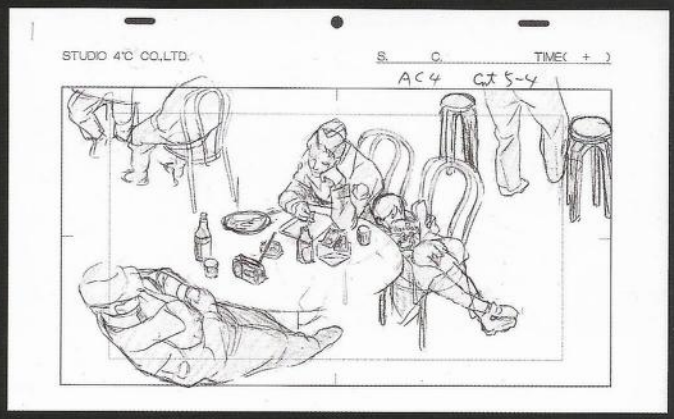
Megalith Schematics

Leaked on September 26, 2005

According to multiple pilots who participated in the ISAF's Megalith mission, this microfilm image was presented at the briefing at which they received their orders. Despite the presence of some Erusean military officers who decided on their own to hole up in Megalith, inside information pertaining to the facility was probably not all that difficult to obtain because Erusean forces had already accepted the ISAF's terms of surrender as of 12:00 on September 19. The microfilm's handwritten notes and arrows are believed to have been added when ISAF top brass held a conference based on this leaked image. One could say that the successful destruction of Megalith after the infiltration of the ISAF's Mobius 1 was the product of this microfilm.

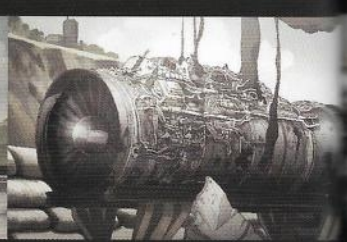


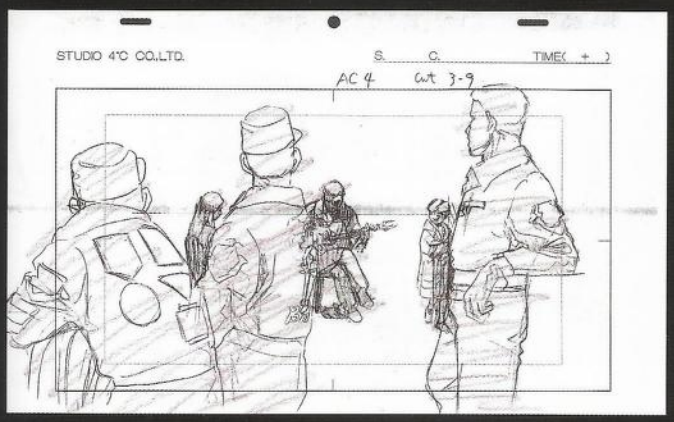


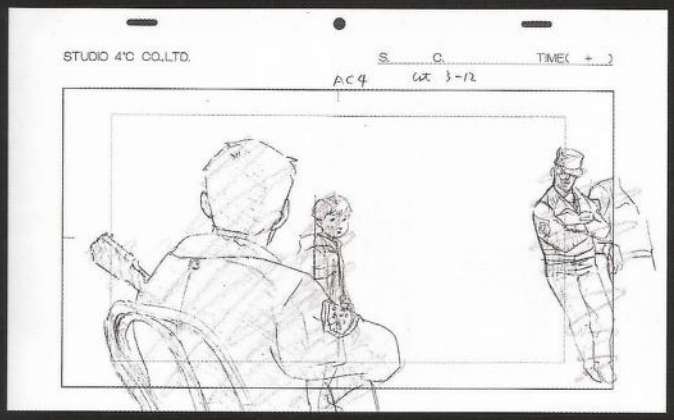


A BARROOM TALE

Mobius 1 was an ISAF ace pilot during the Continental War. While trying to track him down, I met a young man with the same idea at a bar in San Salvacion.
He had lost both parents during the war and was now earning a living by playing harmonica there. The young man told me he had met the Erusean ace Yellow 13 at the bar. Though his parents had died at the hands of Erusean forces, he grew fond of the noble pilot despite himself. He learned first hand of Yellow 13's troubles, loves, and sorrows, and held them dear to his heart. He says he's still pursuing Mobius 1 to get closer to the feeling of Yellow 13, who had lost to his mortal enemy and disappeared into the wild blue yonder.



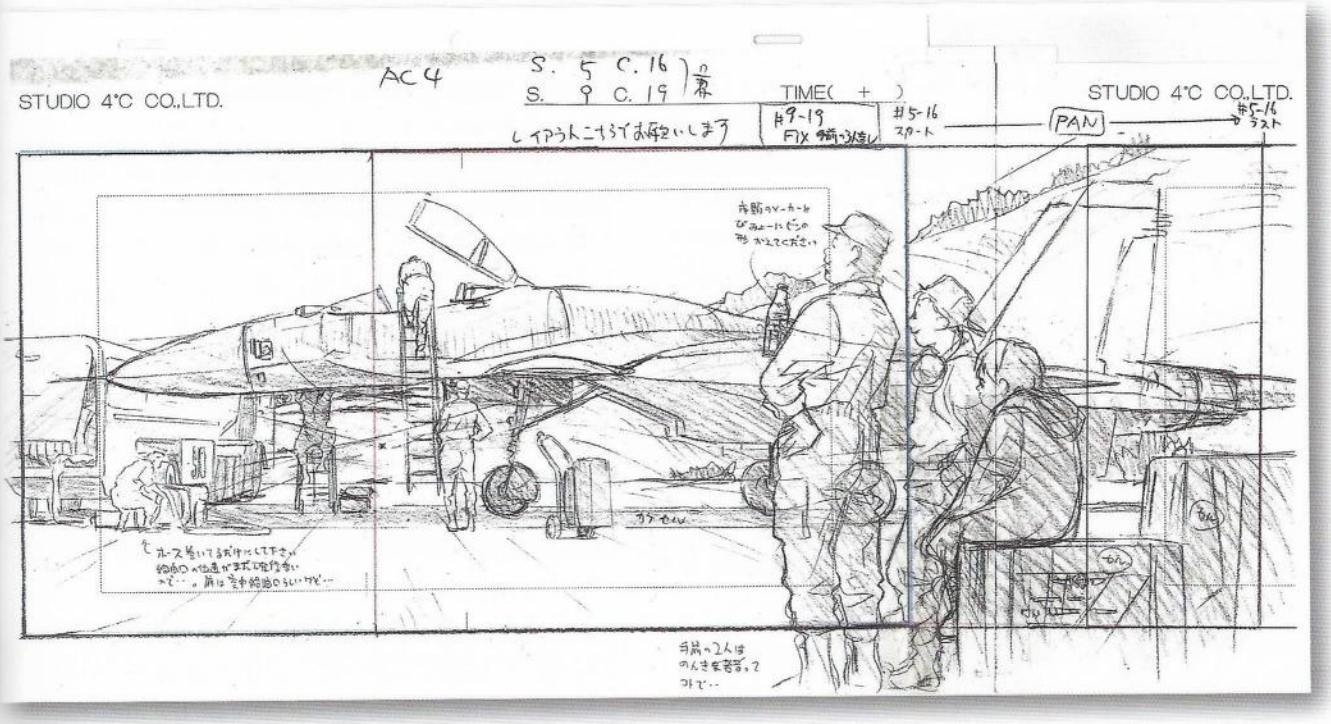


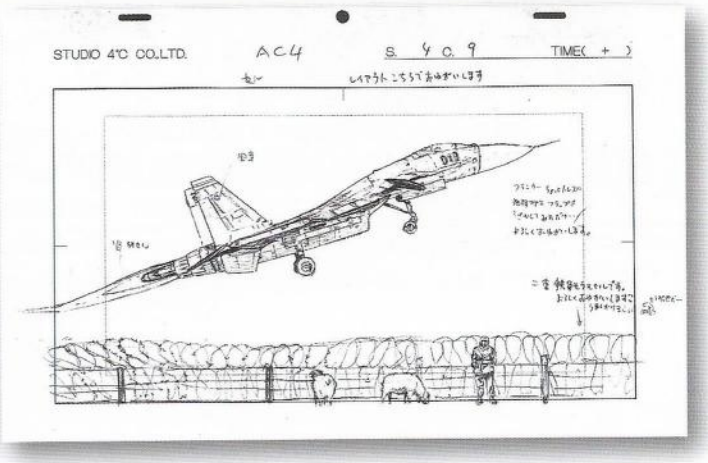


CONTINENTAL WAR

07.2003 – 09.2005

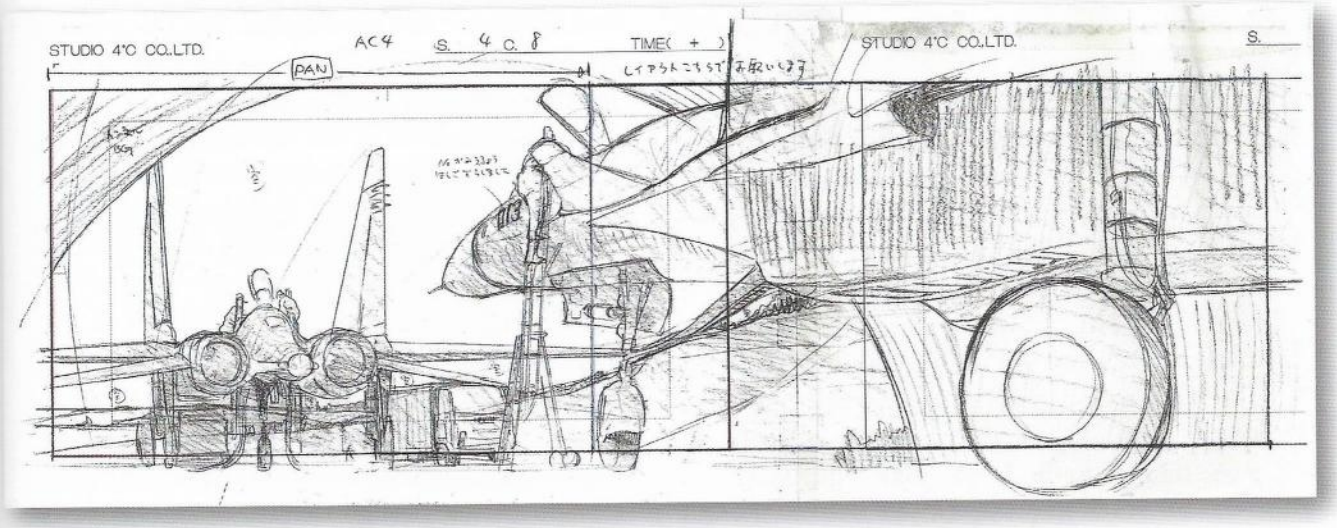
#4-5 FIX





CONTINENTAL WAR

07.2003 – 09.2005



SHORT STORY

"THE WHITE NOTEBOOK"

I began writing in this notebook less than a year and a half since the war.

I'm referring to the conflict in which Erusea pitted itself against the entire continent of Usea. Our homeland, the Federal Republic of Erusea.

In the year 2007, many people were bothered by the idea of digging into the histories of the men who fought in the skies during the war. A person who was once a flying hero was now more or less a war criminal. The occupying allied forces had investigation teams driving around the city in trucks, occasionally taking former soldiers into custody on charges of bombing civilians or torturing prisoners of war.

Before the war, I directed films. I didn't touch on any social issues. My job was to put on a modest drama and attend to the desires of the audience. The war went on and the world grew darker, but each day all of us, the cast and crew, focused on our work, drawing a bit of pride from it. I stayed far away from heroics. My wheelhouse was in seeking out tension and conflict in the lives of ordinary townspeople, adding in a dash of humor, and sneaking in "true humanity." I was criticized for my lack of contribution to the war effort more than a few times. Looking back, I'm surprised I was able to keep making such trivial work.

Now something far more grim sits inside of me. The destruction caused by the bombings and the poverty caused by inflation. The war is over, but we are still exposing the actions and betrayals that happened during it. I've seen far more than anyone should.

First off, there was Marino and Catherine. Marino always played the lead in my comedies, and Catherine was the heroine. The two met on set and got married. The naive foolishness they portrayed was the heart of my films. That is how it always was. Even in the middle of the war, we were shooting a movie starring the both of them.

In the final days of the conflict, their house was destroyed in an air raid. Marino and Catherine survived, but their eldest son joined the angels that day. Catherine was badly injured from her neck to her shoulders. "I can't play in comedies anymore." Those were Marino's last words to me. Ever since, my middle-class sense of well-being has been replaced with a void.

When the war ended, I was taken to a small get-together for people in the industry. "Reconstruction and Renewal" was the theme. It would be a while before I was ready to throw myself at that sort of subject. Still, I could drink coffee there. Luxury items were finally starting to trickle back in, and it was the first time since before the war that I'd tasted something of that quality. I wonder if I thought enveloping myself in that aroma would improve my mood a bit.

The group met a few times a month, and one of my seniors from film school was there. He had made propaganda films during the war. Medal ceremonies. Heroic tales from the field. From this side of things, it was vile business. I felt that way at the time because I had many things yet to learn. My belief was that to portray a splendid hero, you had only to employ filmmaking tricks I'd learned a long time ago, and propagandists created their work from a patchwork of countless ordinary people.

But what is ordinary?

"If you have them read letters to or from their families, you'll figure it out quickly."

Suddenly the conversation had neared my old territory. The old me would have tried to dig up something to build a script from, but I was in more of an introspective, questioning state at the time.

One of my friends spoke up, picking his words carefully.

"Was that his story too? Was he a hero crafted from a number of perfectly ordinary personalities?"

"Who are you talking about?"

"You know the one. Yellow 13."

A pilot renowned for his skill and unprecedented kill count.The idea brushed uncomfortably against something within me, and I awkwardly disengaged from the conversation.

However, I suddenly noticed the former propagandist had a distant look in his eyes. He was connecting two distant points, bringing them into focus. He began to speak. He had in fact filmed Yellow 13 back then.

He'd visited a San Salvacion frontline base for several days, and had approached the warrant officer in charge of the squadron's desk duties. "Could I shoot any of Yellow 13's private correspondence?" he'd asked.

The answer was no.

It wasn't an issue of permission. There was simply no correspondence to film.

Yellow 13. A man with no record but a color and a number. He seemed artificial, like something created solely for propaganda. A person with no background. A fabrication.

"A blank sheet of paper," I whispered.

It was a color that might have matched my own at the time.

And then the white emptiness of a man called "Yellow."

What color and pattern would emerge from this invisible ink?

I began sniffing around. It started out very quietly. In other words, I lightly searched for information on whatever networks I had easy access to. It was fruitless. I couldn't find anything pointing toward the origin of the man who would become Yellow 13.

I started casting my net wider and wider. Most of the air force's official documents were confiscated by the victors, so a civilian like myself would never see them. My only option was to interview people who had been there. They were soldiers who had received letters from their families, and most of them were at home, reunited with their loved ones. They didn't like to tell war stories in an environment like that.

They wanted to keep their contributions close to their chests. They wanted to distance themselves from that part that fought in the war. To me, that feeling looked like sediment that had fallen to the depths of their hearts and sat there under increasing, unresolved pressure. It was a time bomb that they were aware of but pretended didn't exist. Meanwhile, a collection of tales of Yellow 13 slowly gathered in my notebook. As I reviewed the pages under the lamps of cheap hotel rooms, the problem remained. There was nothing like any human I had ever known. There was no portrait there.

Chasing rumor after rumor, I finally met with a retired warrant officer. It was the same man my fellow film school alumnus had met with from the 156th Tactical Fighter "Aquila" Squadron. He had returned to the job he'd held before he was conscripted into the air force. I had heard he was a cheerful, talkative man while he served, but after taking over his father's art dealership, he sat as quietly as one of the antiques in the store. The vessels and sculptures that had survived the conflict all looked chipped and worn, perhaps a trick of the brain.

At last, he spoke.

"There's no riddle behind it. He was a quiet man. Almost frighteningly so. He never talked with anyone about his hometown. That's all there is to it."

After the war, the warrant officer went to the man's listed family address to tell him what had happened to the flight leader. There were no people there, or even a house.

Silence settled on us once again before the man pulled open a desk drawer.

Personnel records. They were original files, not copies.

I jotted down the information I needed into the notebook.

As I went to board a train, I realized something. The locale of the address I had written down sparked a memory. It was one of the dozen or so places struck by a fragment of the asteroid Ulysses when it came down in July of 1999.

I checked it on a map. It was an army map that had been released to the public. The area where a town should have been was covered in the blue of a crater lake.

I should have left it at that. However, that was not the only information I had taken from the warrant officer's files. There was an extract from before he had become a legendary ace. His career as a fighter pilot naturally began long before Ulysses fell.

The place Yellow 13 had learned to fly was listed in his personnel record. What sort of man had he been before he donned his mask of taciturnity?

I no longer cared what I might gain and boarded the train this time in search of the breath of youth. Maybe I thought I'd rediscover some energy I had lost over the years.

The station closest to the training base was still more than ten kilometers away.

I'm glad I decided to talk with the man sitting in a truck outside the station. He was just about to return to his farm across the badlands on a lonely road that went past the base.

The man gripped the steering wheel tightly as the truck bounced along the pavement. The road was poorly maintained, and the man was constantly worried about his tires. One of the tires on his truck was the spare. If any of them went flat, he wouldn't be able to change it. He'd be forced to walk. The badlands are no place for that.

"It happened to me once before."

It was a long time ago, he said, before the war.

He was driving along toward the town with its train station when suddenly a bird cut across the road. It was a big one. Maybe a hawk.

The man cranked the wheel in a panic, the truck went off the road, and one of the wheels got stuck in a hole.

A crowbar wasn't enough to lift it out.

He could always walk home, but that meant abandoning the load in the back.

As he squatted down to consider the better of his two options, he heard a voice suddenly call out to him.

It wasn't the sort of place you'd bump into anybody. There were no buildings around, and he didn't see any other vehicles. The empty badlands stretched out in all directions. One of his ancestors might have thought a spirit had descended to talk to him. Two men had appeared from somewhere and were standing in front of him.

One was young, while the other's hair had already gone gray. They spoke little and immediately started working to free the truck. It took some time for the farmer to realize the men were pilots. They looked similar, with eyes like a bird of prey's. Their planes had gone down nearby because of some sort of accident, and they had arrived after walking for hours.

"Isn't someone coming to get you? You've got helicopters or something, right?" asked the farmer.

"They'll be here soon. Let's get your truck back on the road and save these strawberries before they get here," said the older of the two men.

What did they call each other? The younger called the older "instructor" or something.

The younger was called by his name, but what was it? It didn't help that both of them were extremely tight-lipped.

The farmer vaguely remembered the scant conversation they shared as they constructed a makeshift pulley from a tree. He coaxed the younger to tell him what had happened and why they had landed in the middle of the badlands. The instructor was apparently rather strict.

The farmer remembered him using the word "responsibility." Being at the controls of a plane meant constant responsibility. To the gunner sitting behind you. To the others in your flight group. To the lives of the enemies you are engaged with.

As the farmer spoke, the story began to coalesce.

The two had been flying in separate planes. The younger collided with the older, and both made emergency landings.

The instructor didn't direct any blame toward the younger pilot for the collision. He didn't chew him out for getting too close. He just wanted to know how he had been hit. He wanted to know how it had been possible.

The instructor was talented, so he probably felt he could have avoided it. He may have been famous. The younger pilot was able to get close and hit him. The instructor wanted to know how his student could bump into someone of his talent without giving him the opportunity to avoid it.

I asked the date of the event.

"I don't remember exactly."

I asked for a rough estimate. That would be enough. When I returned to the capital, I contacted an acquaintance of mine who knew a legal officer from the occupying forces, paid a bribe, and obtained copies of the documents I'd wanted. Records of midair collisions. A record of the first enemy that the young 13 had shot down. At last they were in my hands.

From the bundle of accident reports, there were three collisions involving training aircraft at the base. It was easy to find what I was looking for. Each of them was the same.

All three had the same instructor paired with the same student.

The training aircraft would never have hit the instructor unless its pilot was considerably skilled. The second time they brushed up against each other. After the accident that resulted in their encounter with the farmer, 13's instructor decided to repeat the scenario. This third time, the instructor collided with 13.

He searched for the method, discovered it, and repeated it.

As I processed the pair's actions, they began to appear as two white shadows in my mind. It was as though they had no lives on the ground, but rather had an inhuman existence of perfecting techniques in the air.

The instructor. He was the same sort of creature as Yellow 13, and rivaled—or even surpassed—his skill. The farmer said he was scarred and looked too old to be a pilot, but he also seemed utterly fearless. Who was this man? For a moment, I felt curiosity spring up in me, but it froze solid after an instant.

Neither 13 nor his instructor could be human. In any case, they were not in the realm of what I would classify as human. Everyone should have a life on the ground that they pray they can safely return to. Even if the instructor somehow survived the war and was waiting somewhere, there is nothing I would want to ask him.

Now there are two white shadows in my white notebook.

Their blankness is alien to me. It is anathema.

Feeling that I still have some color within myself, I closed my white notebook.

Then I returned to my pre-war work that had lost its shine. I am still a member of the petty middle class in the end.

Section #03

PACIFIC WAR

09.2010 – 12.2010

Two Superpowers End Their Cold War But Military Balance Collapses

In 1995, fifteen years before the Circum-Pacific War, the Principality of Belka was defeated in the Belkan War by Allied Forces, which included the Osean Federation and the Union of Yuktobanian Republics. As a result, Belka lost the vast majority of its prewar territory. The lessons learned and economic losses suffered in this war helped free Osea and Yuktobania from the Cold War that had existed between them due their conflicting ideologies. Relations between the two nations dramatically improved, even progressing into a friendly rapport.

On September 23, 2010, the Osean Defense Force's radar picked up an unidentified aircraft entering Osean airspace. The instructor for the Osean Air Defense Force's 108th Tactical Fighter Squadron Sand Island Detachment, "Wardog," encountered the bogey during a flight training exercise near an airbase in the westernmost portion of Osea. The instructor's plane was attacked without warning, along with the training planes in the area, resulting in the loss of eight lives. On September 24, an unidentified SR-71 high-altitude reconnaissance plane violated Osean airspace. After the bogey failed to respond to repeated warnings, a newly reformed Wardog Squadron tried to force it down, but they came under attack by an unidentified fighter squadron that suddenly appeared. The air battle ended with Wardog shooting down the enemy aircraft. Based on available information, including the direction from which the undefined aircraft entered its airspace, Osea suspected the Union of Yuktobanian Republics was involved. On September 27, an unidentified vessel launched unmanned reconnaissance aircraft off the coast of Sand Island Air Force Base. Fighters from the base shot all of them down, but once again, unidentified fighters appeared and an air battle ensued. Captain Jack Bartlett of the Osean Air Defense Force was shot down during the battle. He managed to safely eject, but was captured by the unidentified ship, becoming the very first prisoner taken in the Circum-Pacific War. At noon that same day, the Union of Yuktobanian Republics declared war on the Osean Federation. The information blackout was also lifted.

Along with the September 27 declaration of war, Yuktobanian forces launched a surprise attack on the St. Hewlett naval base, where the Osean Maritime Defense Force 3rd Fleet was stationed. The attacking Yuktobanian air squadrons struck a heavy blow against the base's naval facilities and several vessels, but with air support from air force squadrons, the 3rd Fleet broke through the Yuktobanian fleet's blockade. The aircraft carrier Kestrel and its supporting vessels managed to withdraw from the combat area. That evening, Sand Island Air Force Base—the foremost bulwark against Yuktobanian aggression—was struck by an air raid, but significant damage was averted thanks to a counterattack by the base's interceptors. On September 30, the Osean Maritime Defense Force redeployed the aircraft carriers Kestrel, Vulture, and Buzzard to Eaglin Straits as the core of a newly formed carrier strike group. In response, Yuktobania launched a decisive surprise attack with the Scinfaxi, a submersible aircraft carrier equipped with massive missiles. Osean naval forces suffered heavy losses.

On September 30, Osea decided to put the Arkbird maneuverable orbiting spacecraft to use as a weapon after Yuktobania deployed the Scinfaxi. A project was launched to repurpose the Arkbird, including sending a laser weapon module up to it via a single-stage-to-orbit (SSTO) spacecraft. On October 3, a Yuktobanian tank corps was parachuted into Osea with the objective of attacking and occupying Basset Space Center. However, Osean Air Defense Force interceptors deployed from McNealy Air Force Base to the west of the space center saved the day. This allowed the mass driver to successfully launch the SSTO craft, thereby delivering the laser weapon module to the Arkbird. On October 4, Yuktobanian forces attacked Sand Island with a large-scale landing operation that included the submersible aircraft carrier Scinfaxi. Osean forces deployed the Arkbird during the battle, and its laser weapon assisted the country's aircraft in sinking the Scinfaxi. The landing operation ended in failure. On October 22, a transport plane with Osean Federation President Vincent Harling on board was damaged by friendly fire en route to the neutral country of North Point for peace talks. Fortunately, Wardog Squadron, which was on air patrol nearby, guided the transport to safety. However, a spy on board killed the pilot. With guidance from Wardog Squadron, the president's secretary took the transport's controls and somehow managed an emergency landing. After Wardog Squadron ran low on fuel, protection of the president was handed over to the Osean Air Defense Force's 8492nd Squadron. On October 25, the Arkbird was damaged by explosives planted in supplies launched from the ground. The spacecraft's engines were destroyed, leaving it inoperable. On November 1, the Osean Federation commenced an invasion of the Yuktobanian mainland. A large-scale landing operation was launched along the coast of the Bastok Peninsula in southeastern Yuktobania, successfully securing the coastline. The Osean forces zeroed in on Cinigrad, the capital of Yuktobania, as its ultimate strategic target.

THE OSEAN FEDERATION

A large nation on the northwest side of the continent of Osea bordered on the west by the Ceres Ocean. After participating as part of the Allied Forces during the Belkan War, it curtailed its expansionistic policies to prevent something similar from happening again. After receiving a declaration of war from Yuktobania in 2010, then vice president Appelrouth steered the nation back toward militarism, but after the return of President Harling, there was a successful reconciliation. The nation's capital is Oured.

THE UNION OF YUKTOBANIAN REPUBLICS

A large nation that covers the northeast of the continent of Verusa. Since fighting alongside the Osean Federation as part of the Allied Forces, it had maintained amicable relations with the country until an internal coup d'état put control of the government in the hands of the military. It declared war on the Osean Federation in 2010, but when Prime Minister Nikanor returned after his imprisonment by the conspirators, he set the nation back on the course toward peace. Its capital is Cinigrad.

THE PRINCIPALITY OF BELKA

A nation east of the Osean Federation reduced to a fraction of its previous size after an overwhelming defeat in the Belkan War. Even so, a group known as the Grey Men who were responsible for the conflict continued plotting in secret on a plan for revenge that would cause war to erupt between the Osean Federation and Yuktobania. However, the old Belkan hardliners were defeated by the Ghosts of Razgriz. The capital of the nation is Dinsmark.

On November 2, an air battle erupted with retreating Yuktobanian aircraft over Dresdene, during which Osean aircraft fired upon an engineering college, resulting in multiple fatalities among the civilians who had evacuated there. Suspecting the involvement of Wardog Squadron, which had been in the operation area, the Osean Force's General Headquarters summoned them for questioning. On November 4, Yuktobanian Special Forces used nerve gas in a terrorist attack in the city of Bana south of the Osean capital of Oured. In addition, Yuktobanian forces hidden among cargo launched a surprise attack against Apito International Airport. Both operations are believed to have been retaliatory strikes for the civilian casualties in Dresdene. On November 14, Osea dispatched the Sand Island squadron after pinpointing the location of the second Scinfaxi-class submersible aircraft carrier, Hrimfaxi. The Hrimfaxi was subsequently sunk in the ensuing battle that unfolded in the Arctic Ocean's Razgriz Straits. That was when Wardog Squadron's enemies started calling them the Demons of Razgriz. On November 29, a peace ceremony being held in a stadium located in November City on the southern coast of Osea came under attack by a Yuktobanian air squadron. Wardog Squadron, which had been performing a ceremonial flyover, defended against the attack, but Captain Alvin H. Davenport's aircraft was hit by enemy fire. Unable to safely land his crippled plane, he aimed it at the stadium's empty field, sacrificing his life to avoid the loss of civilian lives and property. On December 6, Osean forces took Cruik Fortress, Yuktobania's final defensive stronghold. That same day, while flying over the Vladimir Mountains after providing air support for taking the fortress, Wardog Squadron came under attack by fighters from the Belkan Air Force.

On December 7, Wardog Squadron used training aircraft to escape from Sand Island after being suspected of espionage. The 8492nd Squadron pursued the fleeing aircraft, but fighters based on the aircraft carrier Kestrel intercepted and shot down the pursuers over the Ceres Ocean, none of which survived. On December 9, unidentified aircraft and the Sea Goblin helicopter team rescued Osean Federation President Harling from Stier Castle in the Principality of Belka where he was being held. While on the Kestrel after his rescue, President Harling formed a special forces team directly under his control. The team was given the name Razgriz. On December 12, Razgriz Squadron executed an air raid on Yering Mine in northwestern Belka, where tactical nuclear weapons were suspected of being stored. The attack was a success, entombing the weapons under tons of solid rock. However, evidence that a number of them had been previously removed came to light. On December 19, the Arkbird attempted to attack the Yuktobanian city of Okchabursk with a nuclear weapon, but the strike was thwarted by Razgriz Squadron. On December 23, former Yuktobanian Prime Minister Nikanor, who had been imprisoned by the Yuktobanian military, was rescued by Captain Bartlett and the resistance. Bartlett had been the very first prisoner taken in the Circum-Pacific War. On December 29, the Yuktobanian fleet and the aircraft carrier Kestrel engaged in battle in the Ceres Ocean. Prime Minister Nikanor, who was aboard the Kestrel, tried to reason with his fellow countrymen, causing a rift in the Yuktobanian fleet's ranks. Meanwhile, the Osean fleet sped to the scene of the battle, resulting in a three-way battle, but Razgriz Squadron was launched from the Kestrel and successfully sank the entire Yuktobanian fleet. On December 30, the existence of the V2 mass retaliation weapon and the SOLG orbital weapons platform for launching it came to light. That same day, the Kestrel was struck by anti-ship missiles launched from a submarine. The entire Razgriz Squadron managed to take off before it sank. In a televised address, President Harling and Prime Minister Nikanor told their people that there was no reason for their two nations to fight and that the war itself was the result of someone's evil scheme. They then declared the war over. In response to the address, soldiers from both nations' armies mounted an assault on Gründer Industries' facilities in North Osea in support of Razgriz Squadron. However, Gründer Industries sought help in smuggling a V1 small tactical warhead to hawkish factions in both nations' militaries, and they also mounted an attack using the Strategic Orbital Linear Gun (SOLG). But Razgriz Squadron destroyed the SOLG's control facility with the assistance of units from both armies. In the predawn hours of December 31, the SOLG's attempt to attack by crashing into the surface was detected. It was expected to strike the Osean capital of Oured, so Razgriz Squadron was swiftly dispatched to the estimated strike point. The threat was averted when the SOLG was destroyed during its descent. This event marked the end of the Circum-Pacific War.

At a 2013 Federation Supreme Council meeting, Osean's President Vincent Harling announced that all official records on the Circum-Pacific War (the Belkan Conflict) would be released to the public in 2020.

Post-Journal Wednesday, September 29, 2010

FEATURES PAGE E4

The Four Wings of Sand Island

Today marks one week since I landed on Sand Island, a lone speck in the middle of a stunningly blue ocean. And yet, my hand is still too confused, too full of thoughts to even begin putting them down on paper. That is the result of all that I've seen this past week; the events as well as the unique and courageous individuals I've encountered here.

Sand Island is a very small island, nesting on a coral reef. Between the low-lying trees that line the coast, one may see many beautiful, colorful birds rocking their wings.
This quiet island, no more than a two-hour trip to circumnavigate on foot, seems far removed from any unpleasant notion such as war.
However, on this very island lies an airbase owned and operated by the Osean Air Defense Force. The base, located at the edge of Osea's western border, is home to the 108th Tactical Battle Squadron of the Air Force, a unit whose defense perimeter covers the entire Ceres Ocean.
Now, after a sudden and unexpected stream of events, I've become a front-line war correspondent here.

I was interviewing a mechanic from the squadron when we heard the news of Yuktobania's declaration of war.
"This is how it always goes when a war breaks out," he said, gazing at the TV monitor in the mess hall. "It just starts up randomly, in some remote place that none of us have ever heard of. But we're the ones who have to fight to end it.
All we can do is do our jobs the best we can, and get this pointless war over with as soon as possible."

What did the soldiers think of this sudden war?

I asked one of them, the only female pilot in the squadron, "I guess for now, each one of us must continue to think about the best course of action we can take...," she said. And with that, she hurried back to the crew quarters. It was indeed her actions, along with those of her comrades, that saved Port St. Hewlett from total destruction after a surprise attack from the enemy.

All around me, I hear people saying that if the four fighters from Sand Island never appear to provide support, Port St. Hewlett would have been annihilated for sure.
The sheer brilliance displayed in the air by this four-ship formation is, unfortunately, beyond anything I can convey in words. Any attempt on my part to capture their maneuvers on film has resulted in my gaze excitedly following their projectile, feeling as though I was being lifted up into the blue sky right along with them.

The four pilots who saved the naval port from disaster, herself included, are all just young adults. Watching them joke around with each other, one would see a typical group of youngsters, no different from anyone their age. But once airborne with a mission ahead of them, their eyes gleam with the sharpness of veteran fighter pilots.

Another pilot, a Second Lieutenant, graciously answered my questions, choosing his words carefully. He is my host, the occupant of the room I'm staying in during my visit to Sand Island.

Fighters are taking off from here on routine missions quite frequently now. The tension inside the base has risen to an almost palpable level.

"I don't care how tough training is, it's always better than the real thing," he said. "Am I scared? Of course I'm scared. But right now, I'm more scared of doing nothing."

Admittedly, there are many limits placed on the facts I can present from this place. I am bound by an agreement with the Osean Department of Defense to not report on any operations that could endanger the lives of its soldiers.

However, I believe my mission, and my fate, is to watch the tales of war unfold from here, together with these soldiers. What I have seen, and what I will see in the days to come, may only be a small, insignificant part in the entire war. And yet, I can't help but wonder where these four wings of Sand Island will be, and what truths will be revealed, once this war is over.

ALBERT GENETTE

PACIFIC WAR

09.2010 – 12.2010

THE SAND ISLAND FOUR

A week has passed since I set foot on Sand Island, which lies amid stunningly clear blue waters. But truth be told, I'm at a loss as to what to write. I chalk it up to the things that have happened and the brave and unique people I've met.
Sand Island is a small speck of land atop a coral reef. Beautifully colored birds can be seen resting amid the low-lying trees that line the coast. It's a quiet island that would only take two hours or so to completely walk around and seems far removed from the horrors of war. However, it's also home to an Osean Air Defense Force base. Situated on the edge of Osea's western border, the Air Defense Force's 108th Tactical Fighter Wing, a squadron whose defense perimeter covers the entire Ceres Ocean, is based here on Sand Island. But after a sudden turn of events, I've become a frontline war correspondent.
I learned of Yuktobania's declaration of war while interviewing one of the squadron's mechanics. He had this to say as he gazed at the mess hall's TV. "Wars always break out like this. They start up on their own in some place no one's ever heard of. All we can do is try our best to bring them to an end. My only duty right now is to do what I can to get this pointless war over with as soon as possible."
That got me wondering what the soldiers thought of this sudden war. So, I asked one of them—specifically, the lone female pilot in the squadron. "I guess for now, we must keep thinking about the best course of action each of us can take..." Her voice trailed off, and with that, she rushed off to her quarters. She was one of the pilots whose efforts helped minimize the damage to Port St. Hewlett during the enemy's surprise attack.
Many around me are quietly saying that if it weren't for the support of these four Sand Island pilots, Port St. Hewlett would've certainly been wiped out. The amazing maneuvers of their four-plane formation are, unfortunately, beyond anything I can express in writing.
And every one of my attempts to capture them on film has made me feel as though I was being drawn up into the wild blue yonder along with them.
All four pilots who saved the naval base, including the lone female pilot, are young adults. Their attitudes and the way they joke around are no different than most other youth around the same age. But as soon as they're in mission mode, their eyes immediately take on the focused look of a combat veteran.
Another pilot, a second lieutenant, kindly answered my questions, choosing his words carefully. Actually, he's sharing his room with me while I'm on Sand Island. "Training may be tough, but it's never as bad as the real thing," he said. "Am I scared? Of course I am. But right now, I'm more scared of doing nothing."
At present, there seems to be no end to the fighters taking off on patrol duty. And the tension throughout the base is so thick you could cut it with a knife.
Unfortunately, there are many limits on the information I can convey about this place. The agreement I signed with the Osean Department of Defense bars me from reporting on operations that might put soldiers' lives at risk.
However, I believe it is my duty and perhaps even my destiny to witness the war unfolding here together with these soldiers. What I've seen, and what I will see in the coming days, may only be a small, insignificant part of the entire war. But I can't help wonder where the Sand Island squadron will be, and what facts will come to light, once the war is over.

ALBERT GENETTE

When history witnesses a great change Razgriz reveals itself—first, as a dark demon.

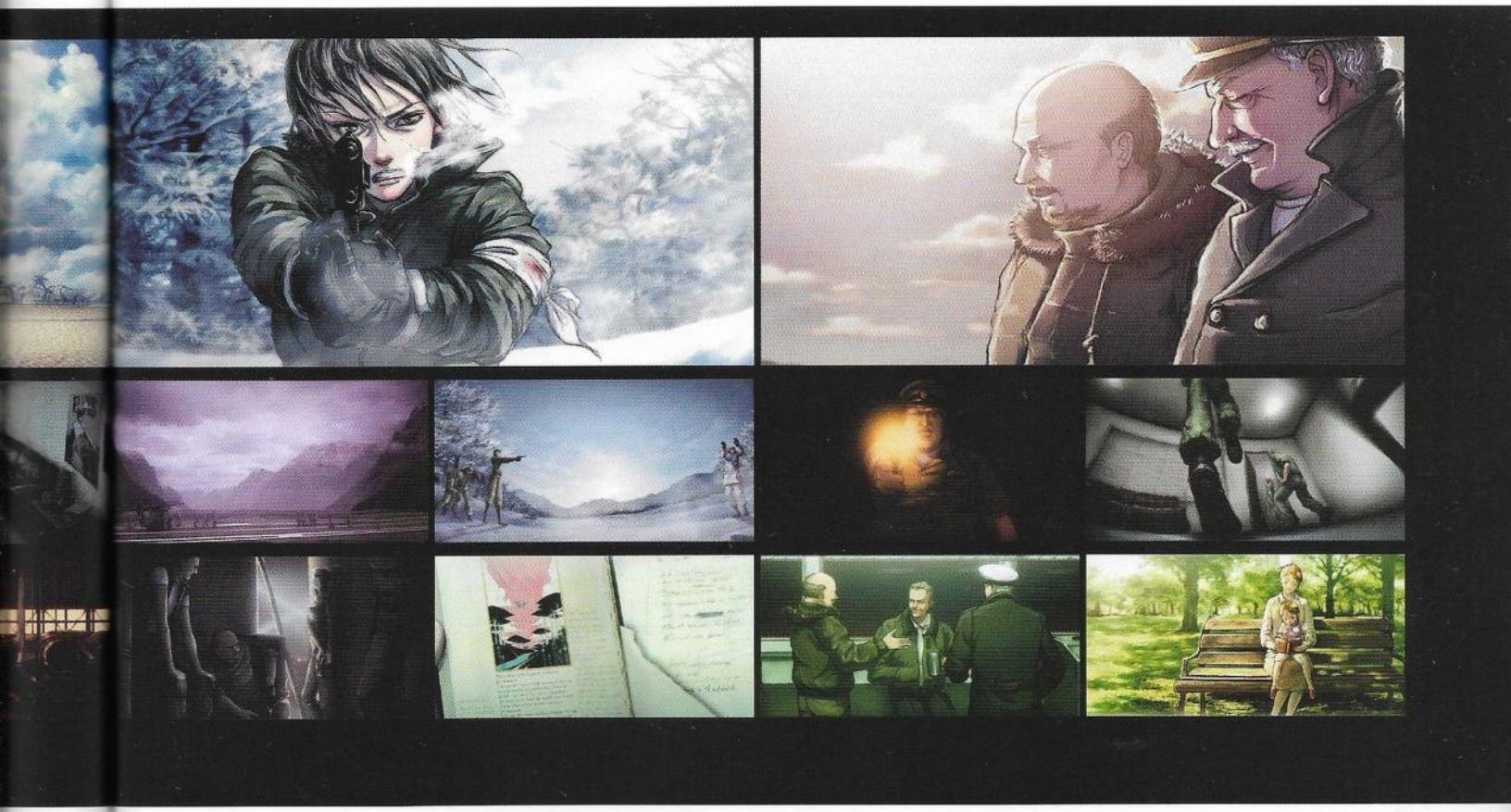
As a demon, it uses its power to rain death upon the land, and then it dies.

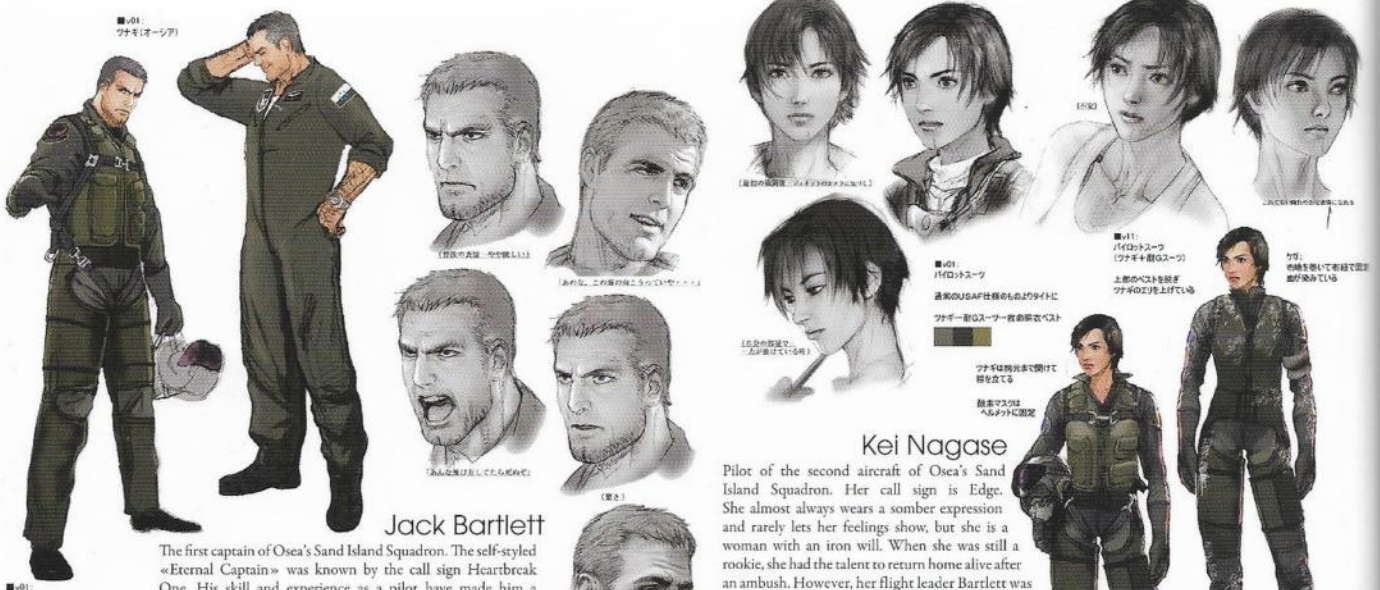
However, after a period of slumber,
Razgriz returns —
This time, as a great hero.

Razgriz

The above is an excerpt from the famous fairy tale, A Blue Dove for the Princess.
The passage contains significant similarities to events that greatly changed the course of the Circum-Pacific War, which may have popularized the epithets «the Demon of Razgriz» and «the Hero of Razgriz.»
As introduced on the previous page, Kei Nagase of Sand Island's Wardog Squadron held the story in high regard, and what is commonly known as «Razgriz Squadron» used a witch (demon) emblem on its aircraft. Regardless of whether they took the name for themselves, considering the testimony of their tactics by pilots who flew against them and the recently discovered signed plans, if my hypothesis is right, though the reason they are missing is still a mystery, these facts may point strongly toward the identity of the Hero of Razgriz.

Osea's Executive Office and Information Agency have both promised to unseal information on the war in 2020. We eagerly await what we may find.



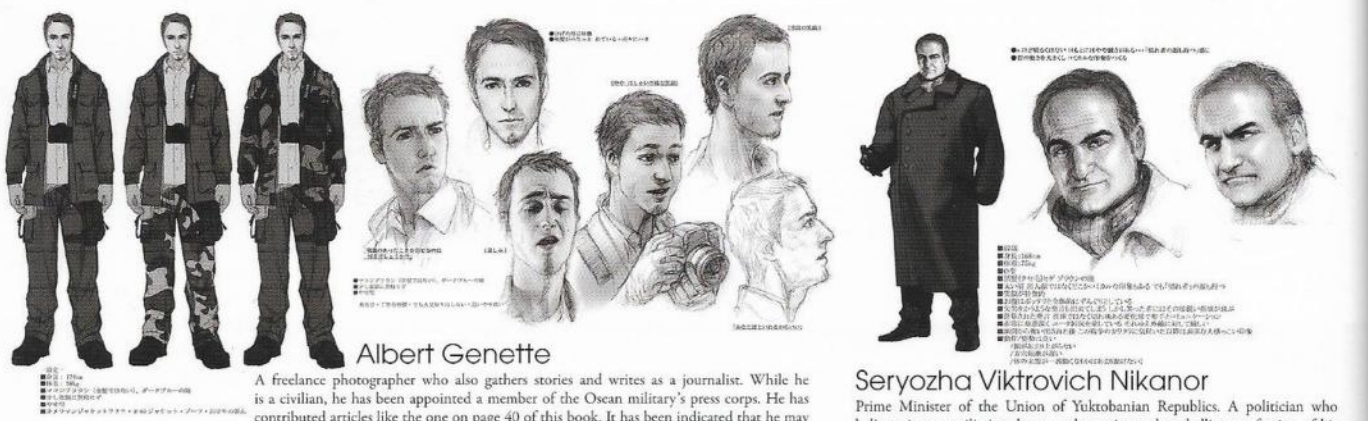


Jack Bartlett

The first captain of Osea's Sand Island Squadron. The self-styled «Eternal Captain» was known by the call sign Heartbreak One. His skill and experience as a pilot have made him a hardened veteran. While he is straightforward to the point of bluntness, his emotions run deep. He was taken captive by the Yuktobanian Army soon after the war began, but managed to escape before he arrived at the prison camp. He was treated as missing by Osean forces for some time, but was in fact operating on his own in the Union of Yuktobanian Republics. After aiding in the rescue of Prime Minister Nikanor and assisting the resistance, he returned home to the Osean Federation with vital intelligence as a souvenir.

Kei Nagase

Pilot of the second aircraft of Osea's Sand Island Squadron. Her call sign is Edge. She almost always wears a somber expression and rarely lets her feelings show, but she is a woman with an iron will. When she was still a rookie, she had the talent to return home alive after an ambush. However, her flight leader Bartlett was shot down because of her failure to check below her. After that, she has been very protective of her flight leader. She is extraordinarily resilient, and once rescued wounded allies after bailing out in hostile territory during a snowstorm, and even captured an enemy soldier who was sent to search for them.

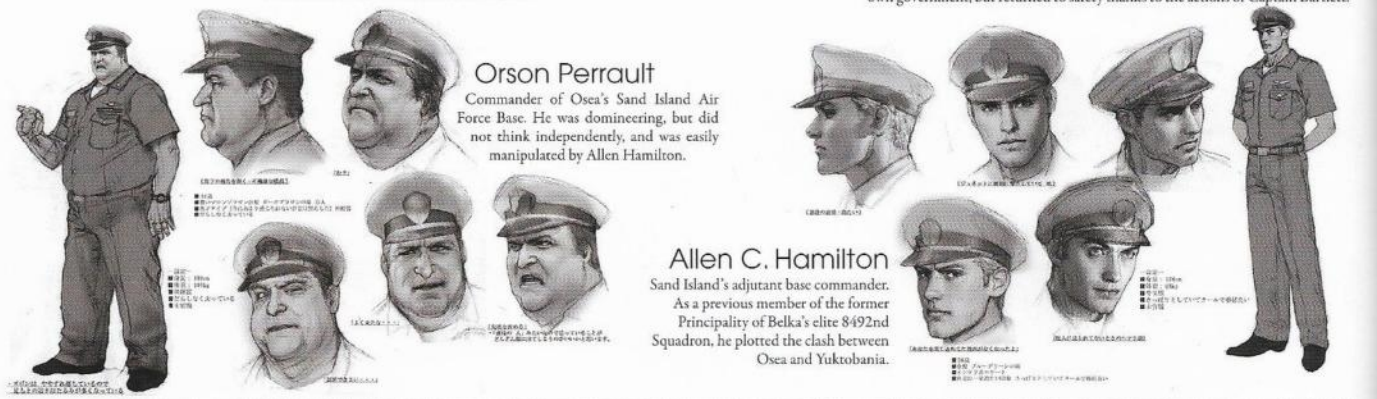


Albert Genette

A freelance photographer who also gathers stories and writes as a journalist. While he is a civilian, he has been appointed a member of the Osean military's press corps. He has contributed articles like the one on page 40 of this book. It has been indicated that he may know the identity of the Ghosts of Razgriz.

Seryozha Viktrovich Nikanor

Prime Minister of the Union of Yuktobanian Republics. A politician who believes in reconciliation, he was taken prisoner by a belligerent faction of his own government, but returned to safety thanks to the actions of Captain Bartlett.

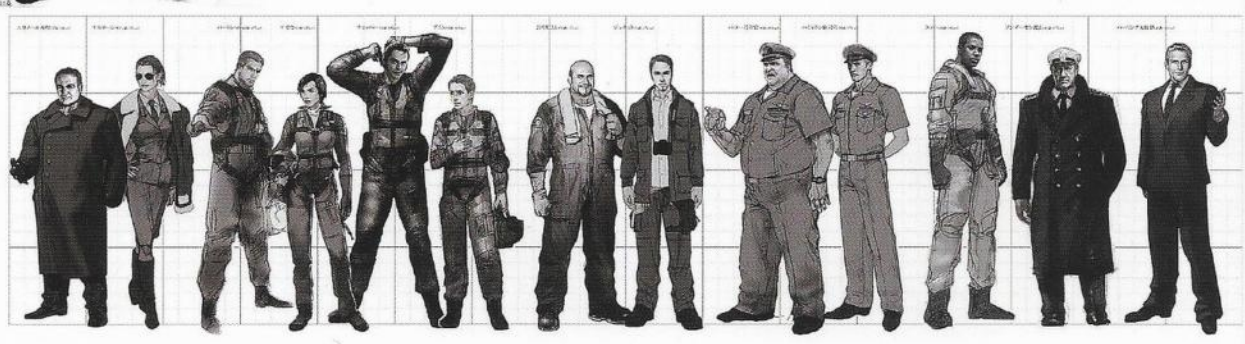


Orson Perrault

Commander of Osea's Sand Island Air Force Base. He was domineering, but did not think independently, and was easily manipulated by Allen Hamilton.

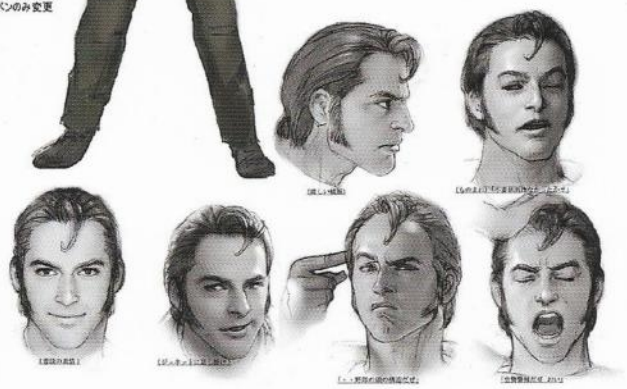
Allen C. Hamilton

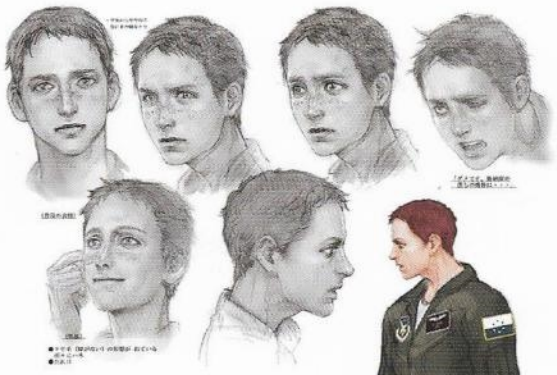
Sand Island's adjutant base commander. As a previous member of the former Principality of Belka's elite 8492nd Squadron, he plotted the clash between Osea and Yuktobania.



Alvin H. Davenport

A pilot of Osea's Sand Island Squadron. His call sign was Chopper. He loved rock and roll, and was known for speaking and acting too freely, but his skill and conviction made him a man who could be relied on. On November 29, 2010, he was hit by an enemy plane in an attack over a stadium in his home country. While the rest of his squadron worried about what to do, he quickly and calmly assessed the damage to his aircraft's electrical and ejection systems, and died crashing his plane away from evacuating citizens and into the field of the stadium. It was later reported that there were only minor injuries and no deaths among the civilians, a testament to his valor.



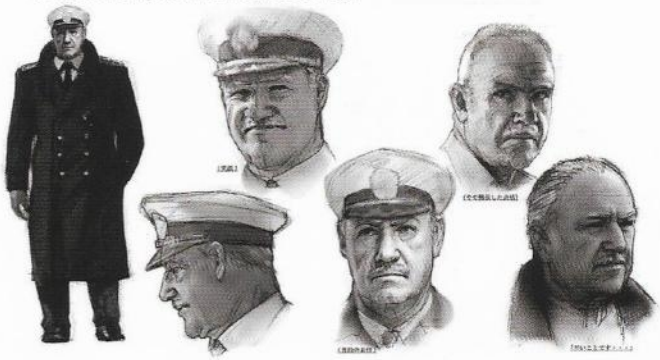


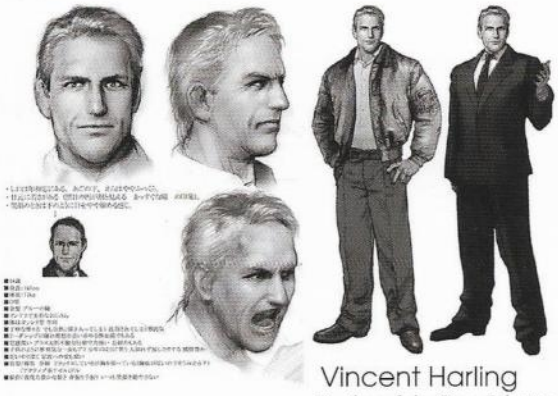
Hans Grimm

A pilot of Osea's Sand Island Squadron. His call sign is Archer. He joined the military because his older brother, who he admired, was in the army. While he is cautious by nature, he possesses a bold side that comes out in times of great need. When the war first broke out and Sand Island Air Force Base was under attack, he knew that although he was still a rookie he was the only person left on the ground who could operate a warplane and did not hesitate to fly to the front lines where he fought impressively. Later, Captain Bartlett would tell him that he would have recommended him for the squadron if he had not been captured. Those words stirred something in him, and he quickly grew into an ace after only a few battles.

Nicholas A. Andersen

Captain of the Osean aircraft carrier Kestrel. He is a talented man with clear judgment and a superb ability to act. He has complete faith in the Ghosts of Razgriz.





Vincent Harling

President of the Osean Federation. A highly respected pacifist statesman, he has direct control of the elite Ghosts of Razgriz, who continue to fight for peace.

Nastasya Vasilievna Obertas

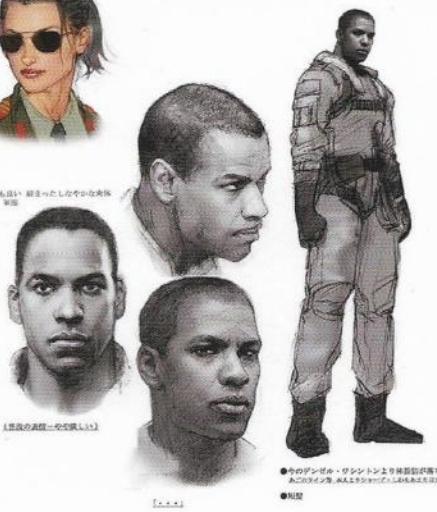
A major in the Union of Yuktobanian Republics' army intelligence division. Fifteen years ago, she was the woman Jack Bartlett loved. She is dedicated to the prime minister and his philosophy of harmony, and strives for the sake of peace.

Peter N. Beagle

A maintenance officer working at Osea's Sand Island Air Force Base. Fifteen years ago, he was an ace pilot for the Principality of Belka called Huckebein the Raven, but he refused an order to drop a nuclear weapon within Belkan territory. He met Jack Bartlett as a fugitive and defected to the Osean Federation.

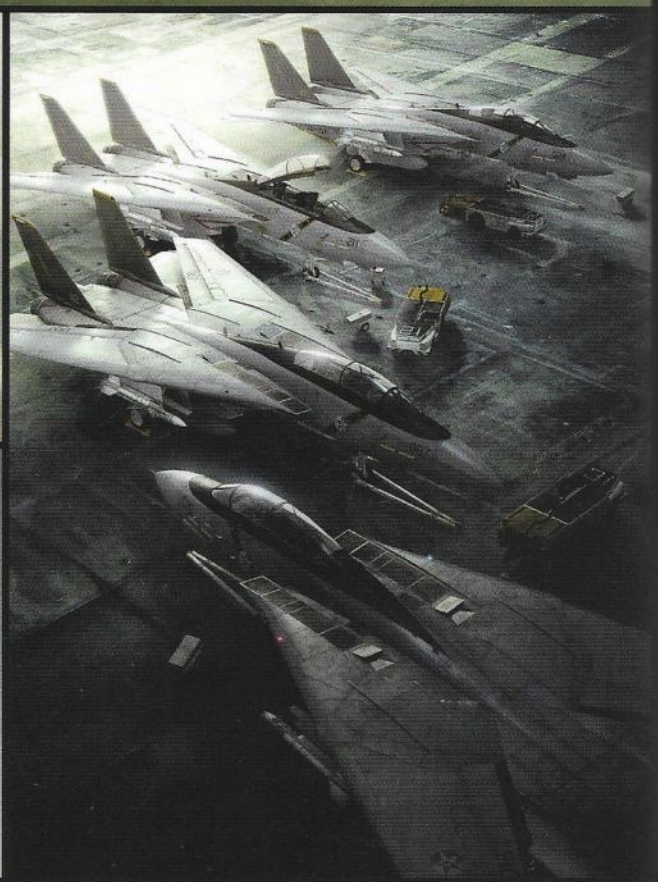
Marcus Snow

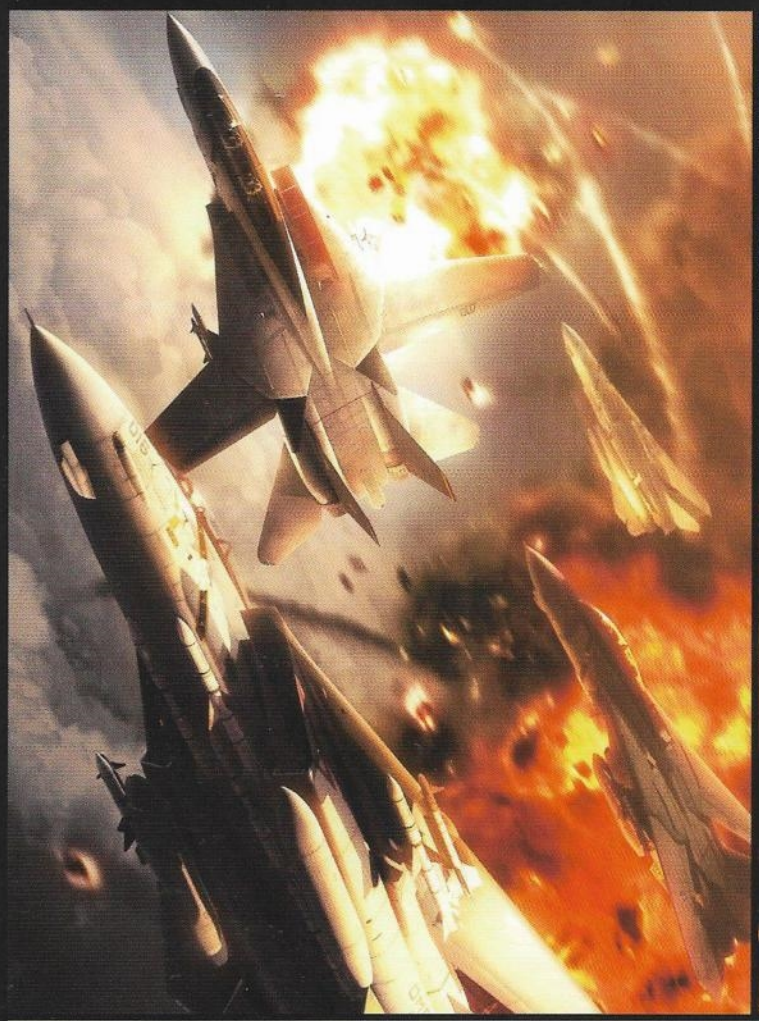
Flight leader assigned to the Osean aircraft carrier Kestrel. His call sign is Swordsman. According to official records, he is the man who shot down the Demon of Razgriz.

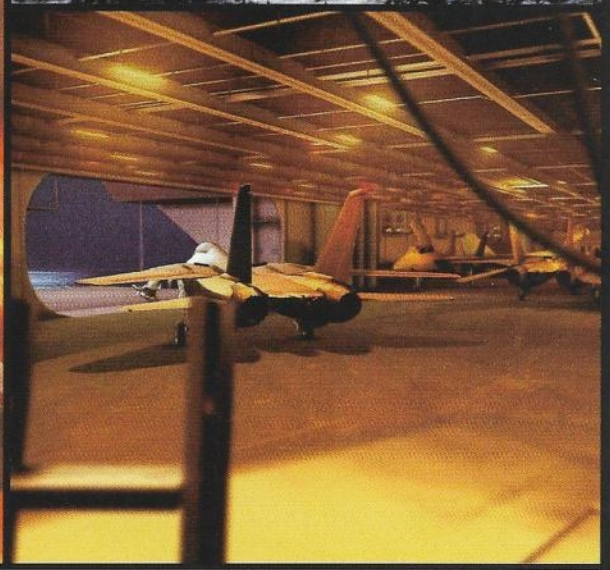


PACIFIC WAR

09.2010 – 12.2010

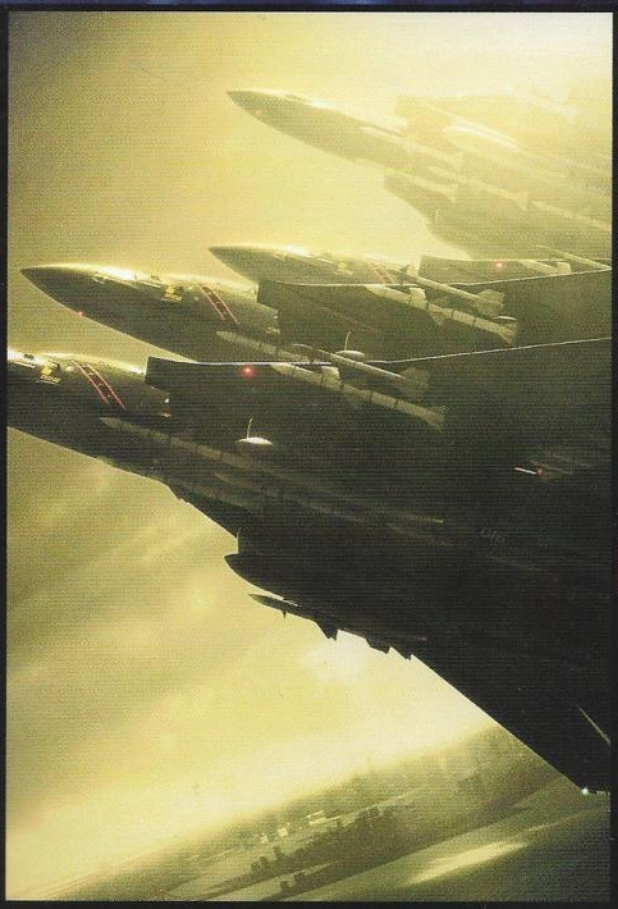






016
016
016

The insignia in the photo belongs to the elite Oscan squadron known as the Ghosts of Razgriz, which was active in the closing days of the Circum-Pacific War. There is a great deal of mystery surrounding the squadron's identity, but based on publicly available information, there is a strong case to be made for it being the Osea Air Defense Force's 108th Tactical Fighter Squadron, a.k.a., the Sand Island Squadron, which was shot down on December 7, 2010 off the Solo Islands in the Ceres Ocean.



For safety reasons, the squadron dubbed the Ghosts of Razgriz only received permission to use planes capable of short takeoffs and landings before taking off from the aircraft carrier, the Kestrel. But due to the state of emergency in the closing days of the war, permission was granted for all types of planes to take off. This sort of episode really gives you a sense of the difficult decisions that ship captains must make.

PACIFIC WAR · 09.2010 – 12.2010

The snake emblem is the symbol of the Grabacr fighter squadron. After the end of the Belkan War, Osea sought to bolster its air power by secretly hiring Belkan aces and forming a new aggressor squadron. They changed their name to the 8492nd Squadron and plotted the downfall of both Osea and Yuktobania, but were defeated by the Ghosts of Razgriz.

OSEA AIR FORCE UNITS INSIGNIA

Ocean Air Defence Force
Air Combat Commando

Ocean Air Defence Force
5th Wing

"THE GHOSTS OF RAZGRIZ"

Razgriz Squadron

An unofficial fighter squadron that operated directly under the command of Vincent Harling, Osea's president at the time. Its name was borrowed from the demon Razgriz, who appears in the fairy tale A Blue Dove for the Princess. All the squadron's fighters were jet black and bore an insignia with a design incorporating an image of the demon. The name Razgriz means "plan wrecker."

NORTH OSEA GRÜNDER INDUSTRIES

OSEA NAVY FORCE UNITS INSIGNIA

Osean Maritime Defense Force 3rd Fleet

Strike Fighter Squadron 206, VFA-206

BELKAN AIR FORCE UNITS INSIGNIA

229th Tactical Fighter Squadron Grabacr

ADF-01 FALKEN

The Belkan Air Force traditionally tends to place an extreme emphasis on dogfights.

This can be attributed to the fact that their lightweight, highly maneuverable fighters have been victorious against the less nimble aircraft of their enemies on countless occasions, and this has become the strategic foundation of their air force. On account of this, they favored fighters with exceptionally high maneuverability, and the ADFX-01's forward-swept wings with canards was, no doubt, the ultimate solution they were looking for. Modern fighter development, with its emphasis on stealth capabilities, views such a wing configuration as a handicap, but Belka never abandoned it.

The ADF-01 FALKEN was developed based on the ADFX-01/02 MORGAN, which first appeared during the Belkan War. In fact, some might even call them sisters. This can be attributed to the visual similarities, including the shape of the main wing, when comparing the two. The following combat data was gleaned from the prototype ADFX-01/02 fighter:

1. The high-power laser is an extremely effective combat weapon.

2. However, it needs to be downsized, and if possible, stowed within the fuselage.

3. Maximizing the laser's long-range firing capability requires the use of advanced sensors.

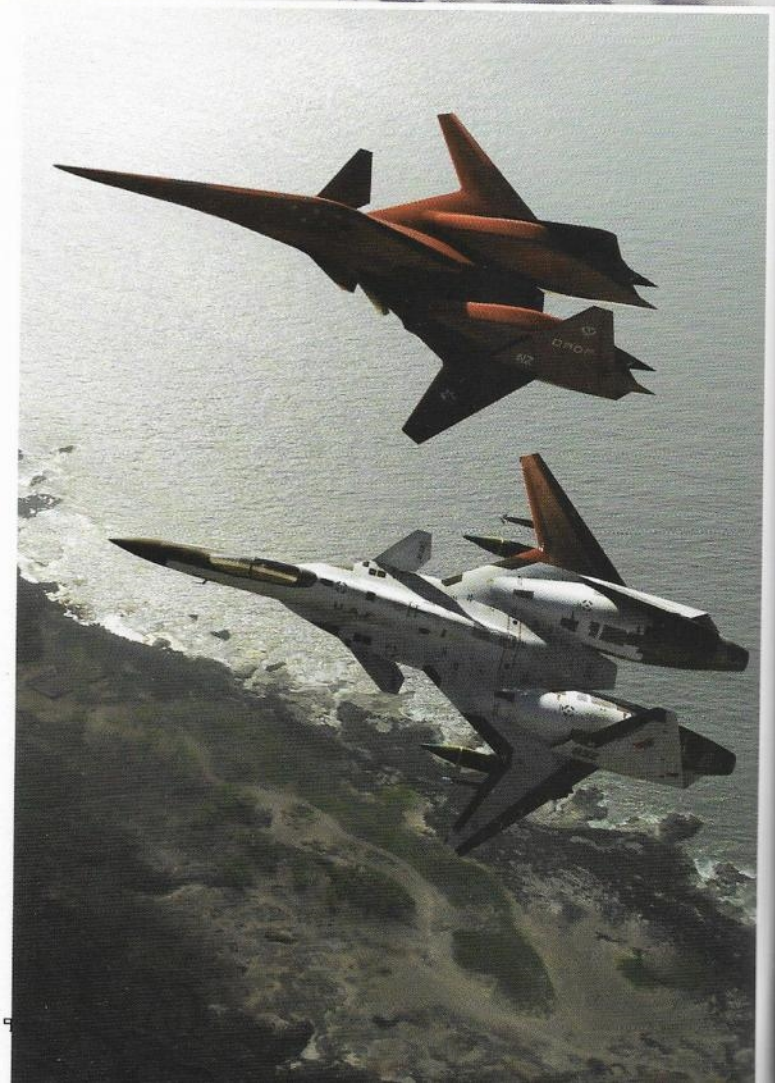
4. It requires stealth capabilities that are more advanced.

Based on the lessons learned from this data, the ADF-01 FALKEN's shape was carried over from the ADFX-01/02, but the laser unit was downsized and stowed within the fuselage. In addition to this, the short-range missiles were relocated within the fuselage and the edge-line angles were unified for better stealth performance, resulting in an even more "ultimate solution."

The photo shows the ADF-01 and ADFX-01 flying side by side. These two fighters are demonstrably linked by their design DNA.

The foremost features of the ADF-01 are its lack of a canopy and its distinctive shape, which is completely covered in sensors. These sensors pick up radio waves across a broad frequency spectrum, including visible and infrared frequencies, and the tactical situation optimized by the AI system Z.O.E. is presented to the pilot on a 360-degree screen. This AI system collects and analyzes combat data, and then learns from it. Thanks to this, the aircraft is already able to perform autonomous missions, and the goal now is to enable fully unmanned flights.

Belka's low population made pilots a precious resource after they lost many of their aces in the recent war. The only way they will ever rebuild their military might is to minimize their troop losses as much as possible, while at the same time shifting to increased automated and unmanned flights.



ADA-01 ADLER

The ADA-01 ADLER was spun off from the ADF-01 FALKEN, but at the time, plans called for the ADLER to come first, while the FALKEN was supposed to be an escort. Its similarities with FALKEN extend to about 42 percent of the plane, including the nose section and engines.

A major difference is the anhedral angle of its gently sweptback wings. The ends of the wings have cutouts with uniform angles, which are designed for better stealth performance than the FALKEN. When viewed from the front, it looks like an eagle flapping its wings downward, hence the plane's name. There are no canards, large stabilizers are equipped on the right and left rear sections of the plane, and the laser unit has been removed. Due to its increased weight, the nose gear uses two tires, while the main gear uses a two-wheel bogie.

It is obviously inferior to the FALKEN in terms of maneuverability, but it can perform in limited air-to-air combat.

The ADA-01 ADLER was developed as an aerial platform for the wide-area destruction weapon SDBM (codenamed "Hypersthene"). Special compartments each storing one SDBM are provided at the base of each wing. The destructive force of an SDBM is comparable to a small nuclear bomb but without the radiation, thereby making it a trump card in conventional warfare.

The SDBM is primarily a polynitrogen compound weapon developed from the MPBM that was equipped on the ADFX-02 Morgan. Polynitrogen is an extremely unstable substance, which makes it difficult to control. For that reason, the destructive force of the MPBM was dramatically decreased for the sake of maintaining its stability. To fully utilize the power of the polynitrogen compound, the SDBM seals it away airtight at extremely low temperatures using a wavelength-synchronized triple-layer electromagnetic shield. In layman's terms, it is as if the aircraft has two extremely large, powerful freezers onboard. When using an SDBM, the protective shield is opened, and it is swiftly launched using a low-impact electromagnetic catapult, whereupon it glides over its target and explodes.

When it is not using SDBMs, it packs an array of anti-surface and anti-ship weaponry, as well as four retractable 30mm Gatling guns for mastery over ground forces. The ADA-01 was developed as an attack specialist that could perform everything from strategic strikes to close air support (CAS).

The photo is a rare glimpse of the FALKEN escorting an ADLER returning to base after a test flight. The aircraft itself had already been completed, but the development of the SDBMs and their special compartments fell behind schedule and never saw action.

Overview	Role	Air superiority/ABL special role fighter
	Crew	1 pilot
	Developer	North Osea Gründer Industries
Dimensions	Length	24.00 m
	Width	15.92 m
	Height	5.64 m

Weight	Plane only	23,300 kg
Propulsion	Engines	Two WWX-GD-425s
Avionics	Cockpit	COFFIN system
Performance	Max speed	Mach 2.2

Weaponry	Fixed weapons	One anti-air machine gun One tactical laser system (TLS)
	Bombs	Fuel-air explosives (details unknown/ under-wing pylon expansion)
	Missiles	AIM-9L/M Sidewinders Meteor BVRAAMs
Other	Aerial refueling	Via the flying boom system
	Carrier compatible	No

"Candy Coating"

ADF-01 with a rare green camouflage coating that is presumed to be an anti-surface measure. Rather than being painted on, the camouflage is applied to the fuselage as a film. This reportedly offers greater durability than conventional coating methods.

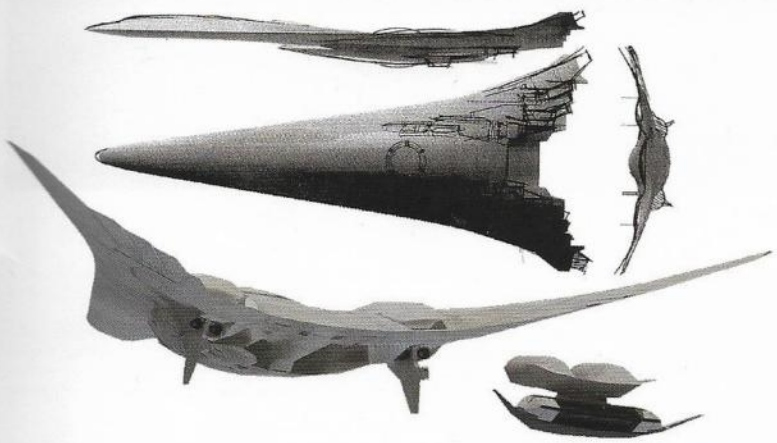
Sperber "Sparrowhawk"

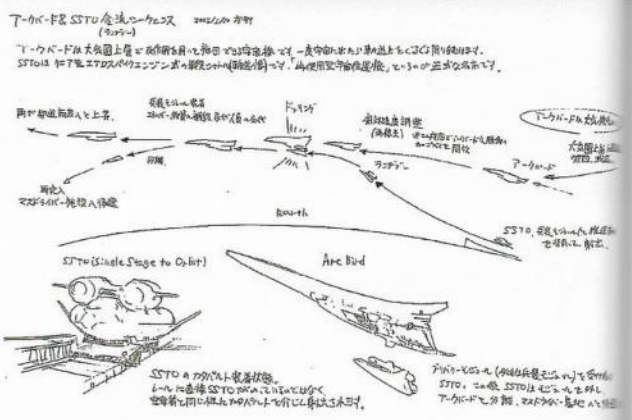
This unmanned ADF-01 has a gray coating throughout the entire aircraft. It was included in the design data seized from Belka following the Circum-Pacific War, and the data has confirmed that they were planning to mass produce it to use in their final offensive. Nickname: Sparrowhawk

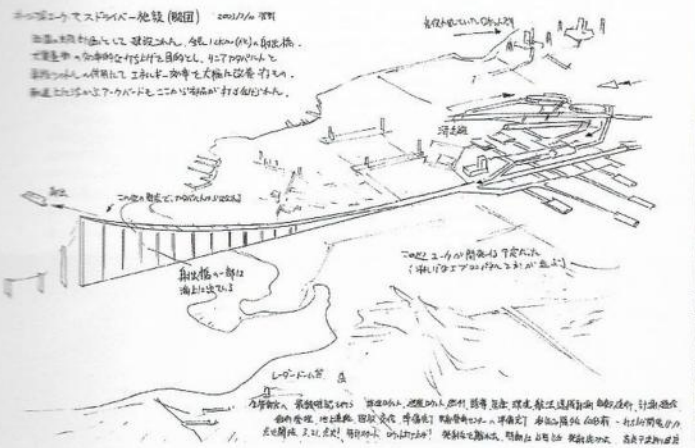
Arkbird

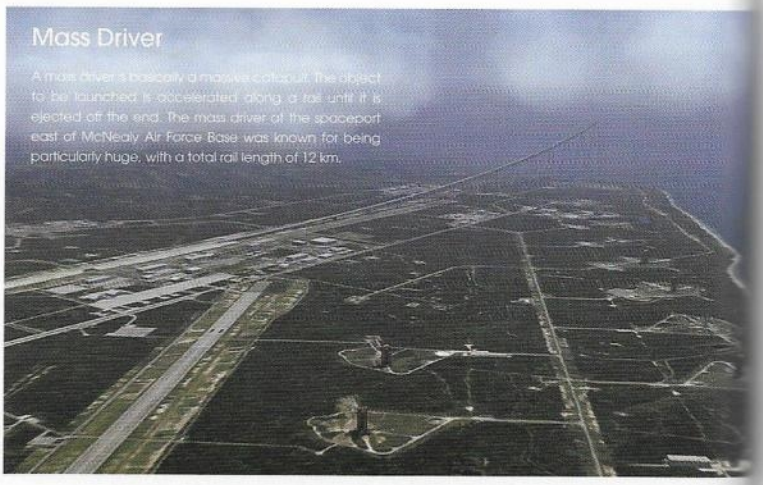
Photographed 4/19/2005

Conceived during the Cold War, the Arkbird was born as a symbol of the Strategic Defense Initiative with an eye on the ground more than the air. It later went into full service in peacetime to eliminate small meteor swarms, but as the Circum-Pacific War intensified, it was put to use as a weapon. After a number of twists and turns, the aircraft ended up in the hands of the Belkan forces, whereupon it was dispatched on a nuclear strike on the Union of Yuktobanian Republics. The Osean Federation's President Vincent Harling gave orders to the fighter squadron directly under his command to prevent the strike from happening. (See the written directive on page 3.) It ultimately sank into the Ceres Ocean and was forever lost in its watery grave.



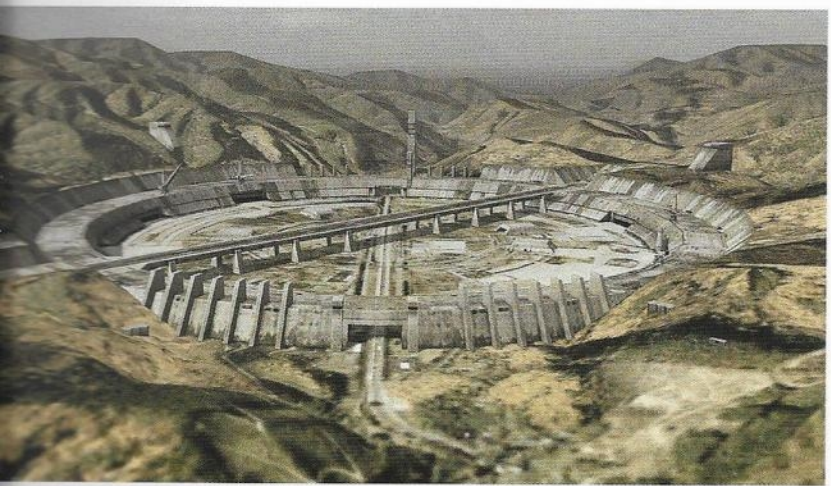






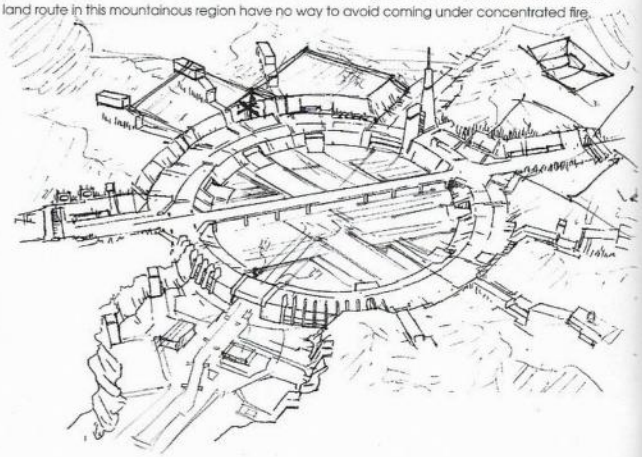
Mass Driver

A mass driver is basically a massive catapult. The object to be launched is accelerated along a rail until it is ejected off the end. The mass driver at the spaceport east of McNealy Air Force Base was known for being particularly huge, with a total rail length of 12 km.

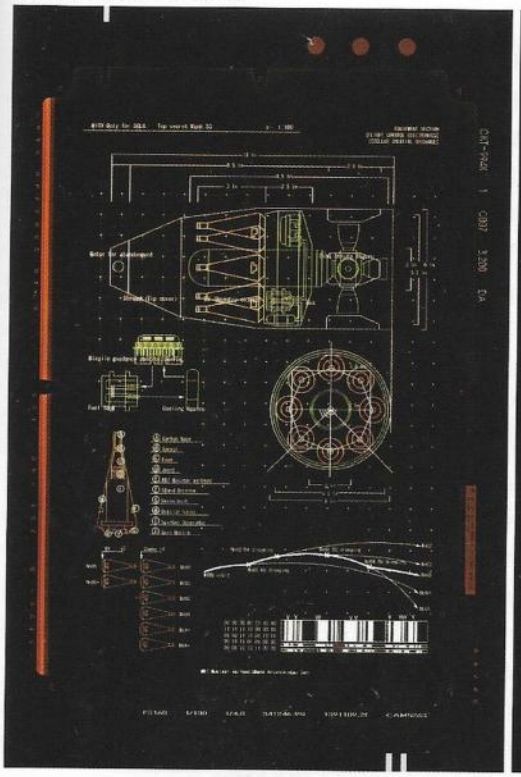


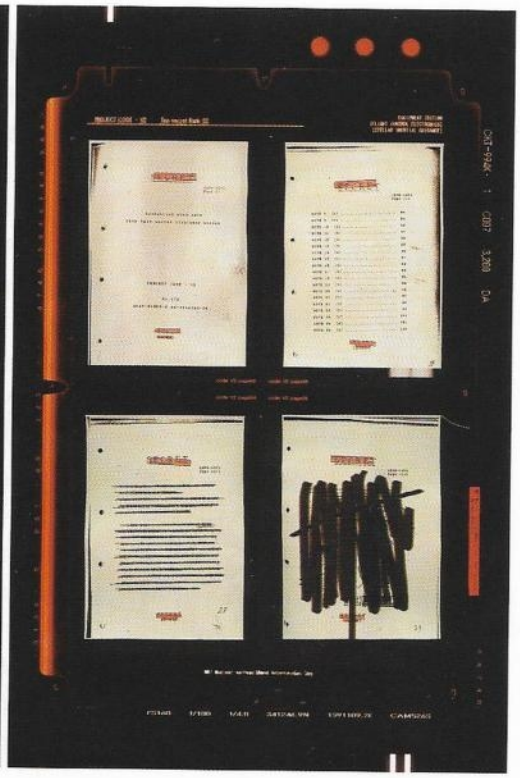
Cruik Fortress

The Yuktobanian Army built this solid fortress as the main defensive measure for their nation's capital, Cinigrad. It has four gates through which tanks can make short sallies at opportune moments, and a runway was built on the elevated bridge so that military aircraft can take off and land within the fort. Encircling the fortress are eight imposing bunkers. Troops that attack this sole land route in this mountainous region have no way to avoid coming under concentrated fire.



MIRV nuclear warhead design images and classified documents leaked from Gründer Industries
Photographed 12/23/2010

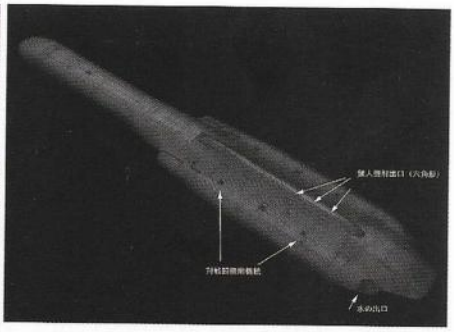




The shock caused by the classified documents leaked to the public at the beginning of the year is still fresh in our minds. They not only revealed the existence of the weapon of mass destruction known as the V2, but also that it had been on the brink of being used. On December 23, 2010, Major Obertas, a Yuktobanian Army intelligence officer, traveled to the Osean Federation with a certain data disk in hand. It was from her disk that the classified information was obtained. According to an investigation conducted by the Osean Army, development of the V2 had begun 15 years earlier during the Belkan War, but the war ended before it was ever completed. After the war, it appears that Gründer Industries secretly took over V2 development as an agent of former Belkan hardliners. A V2 was equipped on the SOLG orbital weapons platform, but they were both destroyed by Osean forces.

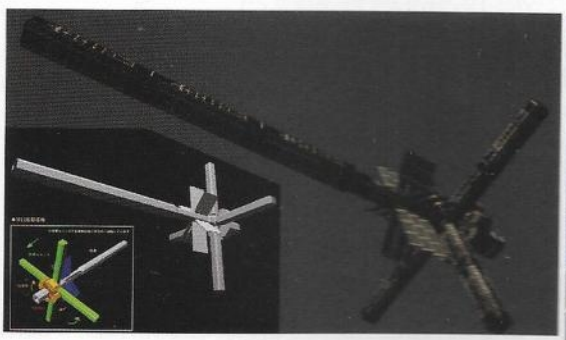
VC nuclear warhead delivery vehicle

This weapon of mass destruction was a delivery vehicle for the multiple nuclear warheads housed within it. The Osean Army announced that it had sealed two nuclear weapons on the bottom of the sea on December 16 and 19, 2010, but they are both believed to have been small tactical nuclear weapons. The V2, on the other hand, was a multiple independently targetable reentry vehicle (MIRV), a missile system capable of delivering warheads to multiple targets. According to the Osean Army, its destructive power is estimated to be enough to obliterate half the major cities of a nation the size of the Osean Federation.



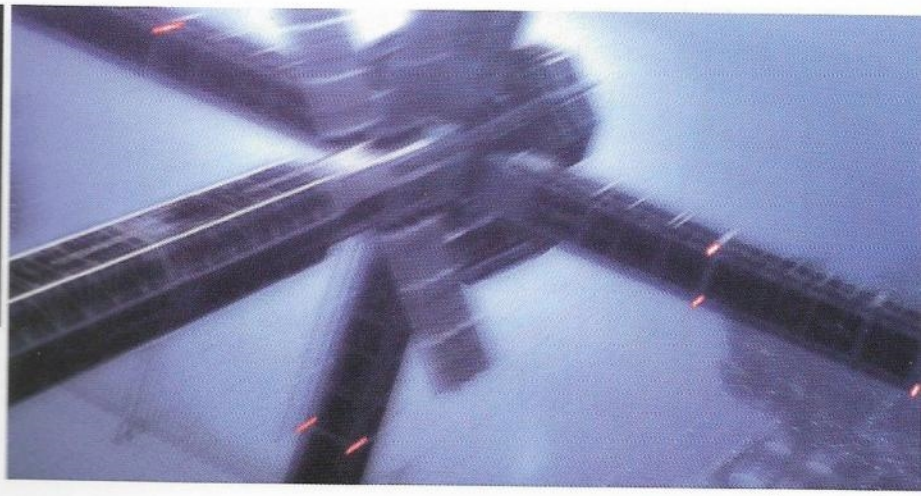
The Hrimfaxi

During the Circum-Pacific War, the Union of Yuktobanian Republics had two submersible aircraft carriers. The Hrimfaxi was deployed after its sister ship The Scinfaxi. Submersible aircraft carriers were a new concept in carriers because they were submarines that could launch missiles capable of hitting a wide area and vertically launch unmanned combat aerial vehicles (UCAV). The Hrimfaxi featured a more simplified system than the Scinfaxi, allowing it to be crewed by a mere 40 sailors.



SOLG

SOLG is an acronym that stands for Strategic Orbital Linear Gun. It was originally an orbital weapons platform that the Osean Federation began developing in 1995 during the Belkan War but later abandoned after deeming it of no strategic value after the war had ended. Its existence became known after it came under the control of the Principality of Belka during the Circum-Pacific War. The SOLG itself was unmanned and relied on a ground-based control system.



SHORT STORY

"GREEN HILLS"

The old man was sharply aware that his time was coming to an end.

The sunlight carried a gentle warmth, and his eyes fell on the soft green of the hills. A hoverfly hummed through the air. Time whispered by. There was no hint of the sea's scent on the breeze. The man was far from the ocean now. When he was younger, its waters always encircled him. Even when its surface looked tranquil, the water was always full of danger. The old man did not regret leaving it behind.

He was offered a car as a retirement gift from the government. It was a high-end luxury model called an Admiral, and a driver would be provided. He questioned why the navy thought he deserved the services of an orderly in retirement. The idea of riding in a car with that name pained him, as did the idea of having a driver. He wanted to run away from his role as a commander for the rest of his life. So he declined the offer.

The old man pondered at a sense of stubbornness that he'd never felt before.

The reason he chose a place far from the water was a fear that, by some fluke, he might be buried at sea. He wanted to spend eternity under the grass of the hills.

Burial at sea.

Sinking deep into the midnight blue water.

When he became lost in those thoughts, the memory of the sea's color filled his mind.

When the old man was far, far younger, he spent time as a cadet. He was born into a family that had been sailors for four generations. The desire they felt for him to board a ship and work at sea was obvious to him as he grew up. It seemed normal by the time he reached his teens. His natural course took him to a naval academy. When he got there, he was confronted with a question. Which branch of the navy did he want to spend his future in? He began thinking for the first time. The sea had been near him since he was born, but what did it mean to him? Being a sailor was a fate he had to accept, but he thought he might at least find a tranquil space under the surface where there were no waves. He realized that he wanted to serve aboard a submarine.

As the old man reminisced about his younger days, he understood he'd always carried a desire to live quietly, apart from the worries of the world. He had made no progress. Now he had reached his twilight years without ever enjoying the thrill of accomplishment.

Even so, back then he searched in earnest for a quiet, peaceful place. He requested to be stationed on a submarine. It had been a mistake.

He received his new appointment at the St. Hewlett naval base, but the vessel he was supposed to board wasn't there. He immediately went to the airport and rushed to board a plane. The submarine base that was to be his new home was all the way on the other side of the continent in Bana. Another cadet assigned to the same vessel was aboard the plane, and they sat next to each other. The other cadet introduced himself as Andrew Jacomb-Hood. He didn't say much, which made him an ideal person to have at one's side under the sea. With nothing to mark the beginning of a picture-perfect friendship, the plane carried them up and away.

Atmospheric conditions were less than ideal. The body of the aircraft shuddered through the sky. There were few clouds, and the scenery on the ground stood out stark and clear in the sunlight. It was an uncomfortable, shameful feeling to be soaring above it. The man felt out of place.

They landed at the submarine base, narrowly making it in time to board the S.S. Blue Tarpon, which was setting out for a two-month voyage. The great iron whale would be their home from that day on.

The vessel slipped under the waves. Andrew had a different schedule, and the two rarely met. Inside the vessel, there was no way to look outside, except for one merciful glance through the periscope, so the lightless world of water surrounding them was left to the imagination.

A submarine crew was forced to endure harsh conditions, so they were provided with reasonably good meals, and it was difficult to complain. The captain and executive officer were kind. The officer the young cadet served under was somewhat difficult. Occasional mistakes due to a lack of experience were met with irrational shouting.

It seemed the officer had dealt with other cadets and could roughly predict when they would make mistakes, but could not stand it when they were made as expected. The only way around it was to avoid errors. The cadet wrung his mind dry.

As the voyage neared its completion, there was an accident and the vessel was unable to surface. It was not due to anything the cadet had done or failed to do. The problem was in an unrelated area, and he was just a bystander, but nonetheless, his fate was sealed.

Fuel from a leaking training torpedo had exploded, and the submarine was rapidly taking on water. The captain ordered the vessel to use what power it had left to move toward shallower waters, which was the best decision possible. The executive officer had already died in the fire in the bow.

The vessel settled with the conning tower only a little over 20 meters from the surface, but getting there would be difficult.

Time passed, and the flooding could not be stopped. The captain knew that a submarine rescue ship could not make it in time. The only one available on this side of the continent had been sent out four hours earlier to assist another submarine near Oured. The operation was still underway.

They would only be able to open the hatch once while underwater. How many could escape in that time?

There was no drawing of straws. The officer proposed sending personnel out from youngest to oldest, even though he had a wife and child. The cadets would be the first out. Andrew was older by two months. Neither were old enough to be married or have children, and fewer would mourn their deaths than those of the officer or other crew members. The captain entrusted them with a letter to fleet command.

Led by the cadets, the crew collected breathing equipment and climbed the ladder. When the hatch opened, an air bubble went up. It formed a dome the same diameter as the hatch and wobbled as it fought against the pressure of the water. Outside of it was nothing but deep blue.

The young man pushed his way through the dome and into the cold, dark water. He was followed by Andrew and several other crew members.

Midnight blue.

He searched for a slightly lighter shade in the expanse and swam toward it.

The color of the sky came into view. It was the surface. It came closer with agonizing slowness. Going up too quickly would cause decompression sickness. He felt his lungs swell, and when he could no longer stand it, he broke the surface.

He came up under a brilliant blue sky.

The clear color went up forever, without any sign of imperfection. The line of green hills on a cape in the distance seemed unnatural. Until the rescue helicopter came, the young man gazed at those two colors: the soft blue of the sky and the emerald of the hills on the shore. The color of the water swirling under him was hard to recall.

The young man was transferred away from submarine duty and onto a surface vessel. The navy had concluded that the event had traumatized him. As one of the four people who survived the accident, it was impossible to think of those who had been left behind without suffering. It was the young man's first loss.

After that, he experienced several other accidents, but always emerged among the survivors. He could not think of it as simple luck. He even thought that perhaps it would be better if he died in the next accident. However, none of his errors led to accidents, and he spread no harm through cowardice.

Eventually, he came to serve aboard an aircraft carrier. It was a massive ship that would not sink so easily. The light blue sky overhead was radiant.

At some point after he'd reached the rank of commander, a conflict erupted and his carrier was sent out.

The light blue sky overhead was radiant.

At some point after he'd reached the rank of commander, a conflict erupted and his carrier was sent out. As the ship approached the waters near the trouble spot, the ever-jocular crew members were launched one after the other into the sky. When they sat on the deck, the birds seemed ostentatious, but there was a beautiful freedom in the way they circled off toward the horizon.

Once the work of sending the planes off was done, the only thing to do aboard the carrier was wait until they returned. It was a cruel job. No one aboard other than the people commanding in the operations room could do anything to contribute to the battle until the aircraft came home. It was like being paralyzed. Even if they knew their squadrons were facing a superior foe in a vicious battle, nothing they could do would change a thing. It felt brutal. However, there was also complete tranquility.

During the excruciating wait, a thought arose. Perhaps the quiet time he sought in the darkness under the sea when he was young was in fact this. Did he long to be outside of things? When he was on the submarine, he was certainly an outsider that contributed nothing, but the vessel still sunk.

When he entered the operations room, it was an entirely different scene. The enemy possessed unexpected anti-aircraft missiles, and several of the planes that had taken off earlier had been hit. None had been shot down, but some would have trouble making it home. They scrambled a rescue helicopter.

Again, tranquility returned. It was a false tranquility, but for the moment, no one aboard the carrier had to worry about making a disastrous mistake.

The conflict expanded into a war, and the carrier sent out squadrons time and again. Losses began to pile up. Empty places in the mess hall became too obvious. While the crew aboard the aircraft risked their lives, the barren hours on the carrier repeated themselves.

At last, the first plane returned. The crew on the carrier knew the number of planes that would not be coming home, but still they counted the ones that landed on the flight deck. One. Two. Why didn't they count when they took off from the ship? It would be the last chance to count the ones who were lost.

The faces of the ones who had clambered out of the birds on the deck were haggard.

The man remembered the midnight blue of the water when he left the others on the doomed submarine and thought that those crew members might feel the same way about the light blue of the sky and the comrades they had left. He had longed for the color of the sky so much when he came up to the surface, believing that he belonged under it, but for those men, he thought it must be bitter. It could not be escaped.

After long years of service, the man was promoted to captain and given command of a carrier. He survived a number of conflicts and a major war. Afterward, he became an admiral and, in time, retired.

He felt he lost every battle. In every operation, he ordered planes to launch and then waited with nothing to do. He was powerless, and with each squadron lost, each plan foiled, the sense of defeat grew. In the end, the only thing he could do properly was withdraw. He ordered the ship to move away to gain distance before attacking aircraft could move in, preventing the ship's crew from being added to the list of casualties. In retreat alone could he be active. It was the sole option for a man who only knew defeat.

The old man had neighbors who lived a few minutes' walk away, and he sometimes invited their boy to go fishing in a stream. It was the only place nearby that even remotely resembled the sea.

He spent time with the boy and his dog.

The old man was used to being around young men, but this time he wasn't in command. He was only an apprentice when it came to fishing.

The world of things he still had to learn delighted the old man. How had the sea and all that it touched dominated his life so far? The man grieved that he had such little time left to spend. Something was changing within him. He did not believe it was simply his body aging.

This time truly was the only time he had left.

A letter arrived.

It was from one of the men who once served under him. It included the name of the place he worked after being discharged and the name of the company's owner. He knew he wouldn't be able to flee from this. The owner was the son of the officer, the son of the man who had sent him to the surface first. If that person had sent a message that he wanted to meet through a man who used to serve him, then he would just have to meet. He felt he might have been waiting for this day to come for many years.

"I'm sorry for going back on my word."

The old man apologized to the boy. He was unable to go fishing that day.

The old man sat on his porch and waited. Waiting like that reminded him of his time on the carrier.

Eventually, a car appeared on the road snaking between the green hills.

The car stopped, and a man stepped out. He was a member of the crew when the old man captained the vessel.

"Hello, Captain Snow."

"I'm not a captain anymore, sir."

"Then there's no need to call me sir."

Captain Snow introduced his companion as Mr. Haines.

The resemblance to the officer was visible in Mr. Haines's features. It was hard to meet his eyes.

"They pulled up the sub that carried my father."

The old man remembered because he was there. He met Mr. Haines at the time. He was still a boy then. That boy saw his dead father on the submarine that had been hauled up.

The old man didn't know what to say. He fought down the urge to flee.

"After a lot of thought and self-reflection, I decided to start a salvaging company. We fish out all sorts of things that have been resting under the waves and return them to people on the shore."

"We have a submersible research vessel. I'm her pilot,"Snow chimed in.

"And so," he started, and pulled out a sheaf of large photos that had been printed out. "Take a look at this. We found the Kestrel."

The old man's hands didn't move for the photos.

"Let me say that again. We found the Kestrel. She's 300 meters down. Everything's still there. The reserve aircraft are still in the hangar, right where we left them that day."

One of the photos showed a plane at the bottom of the sea. The old man finally accepted them. There was the propeller that he'd never seen. There was the bridge. Yes, the old man had been there that day. Now it was surrounded by midnight blue.

Mr. Haines, the officer's son, spoke.

"On that day, you sent out a squadron to safety before the carrier sank. That squadron brought the war to an end, and thanks to them, my son survived. He had been conscripted into the Yuktobanian Army."

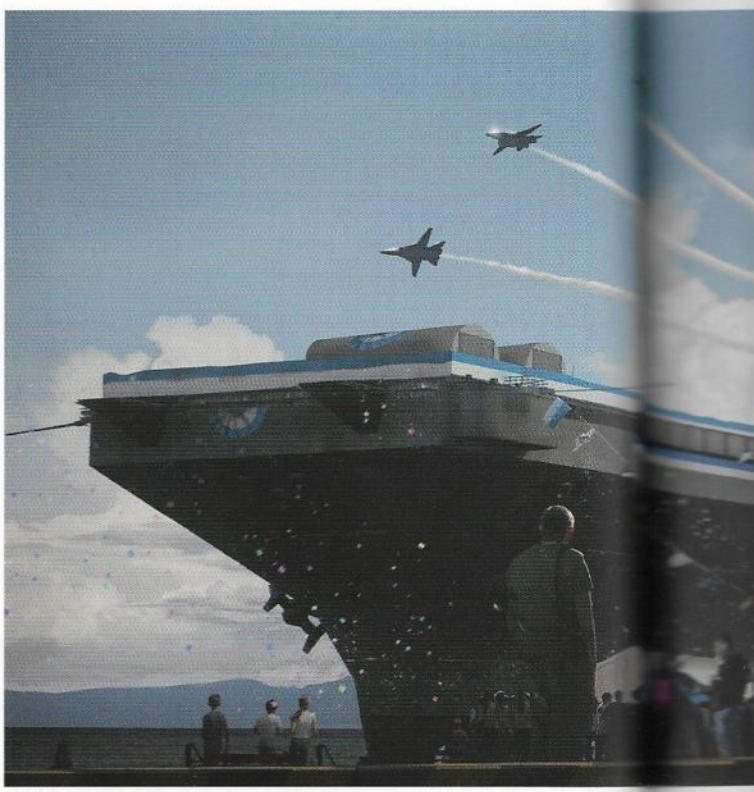
The old man caught a whiff of salty air. The sea breeze shouldn't have been able to reach that far.

"That day," the old man finally began. "That day, the evacuation of the ship went well.

It was my duty to leave the ship last, and I evacuated too. And on that day, everyone who took off from the ship returned home."

"All four planes came back. No one on them is still serving, though."

The last time he visited the sea, it was the Ceres Ocean. Snow, the retired captain, piloted the submersible that carried them into the midnight blue. The old man hadn't been aboard a submarine since he was a cadet. He saw the aircraft carrier Kestrel, the last vessel he had commanded, lying on the seafloor. It was a symbol of his only victory, but above that, he wanted to commit to memory the sight of the massive weapon sitting idly in the depths.



She was sleeping. He would never have to sit aboard her and wait. He felt tranquility. It was the first time in many long years.

A year later, the old man passed away.

His grave reads only, "Nicholas A. Andersen."

It stands over light green grass on a hill. There—not the sea nor the sky—is the proper place for him to rest.

The Secretary of the Navy announced a new class of aircraft carrier. They would form the core of a next-generation carrier strike group and be capable of launching fighters ready to take down any possible target. Each vessel in the series would be named after great heroes of the navy, and the first is planned to be christened the Nicholas A. Andersen.

Section #04

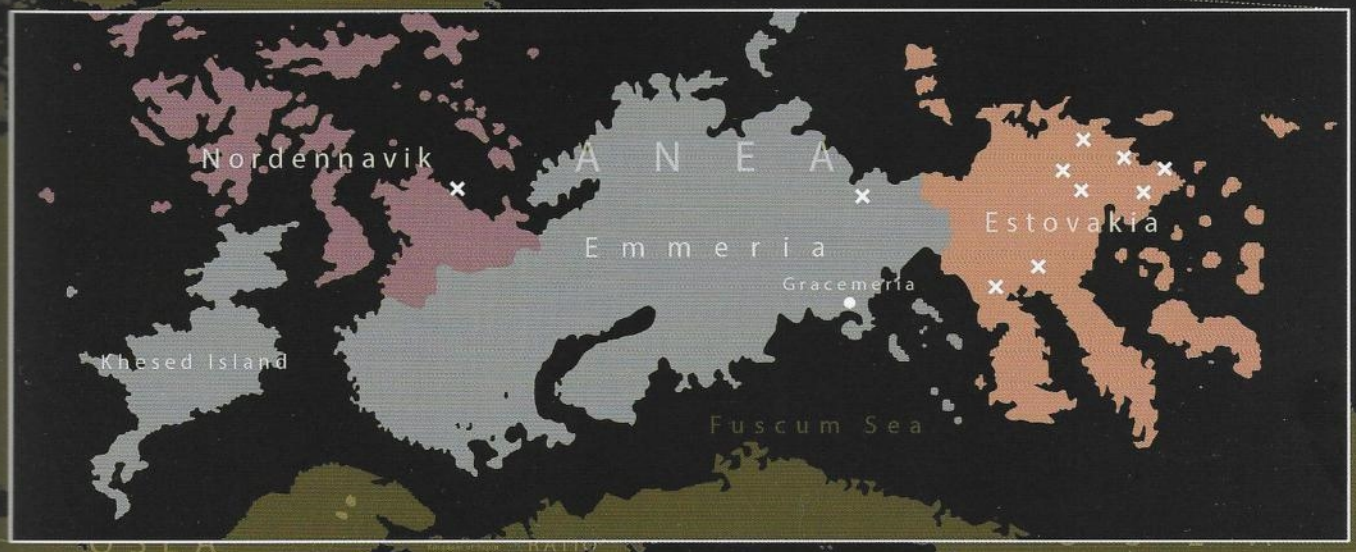
EMMERIA ESTOVAKIA WAR

08.2015 – 04.2016

RICH NATION, POOR NATION AN ASYMMETRIC WAR BORN OF ULYSSES

In 1999, the asteroid Ulysses shattered into countless fragments that began raining down all over the world.
The Republic of Emmeria suffered little damage, enabling it to quickly get back on its feet, while the Federal Republic of Estovakia was dealt a heavy blow that collapsed its economy and plunged the country into civil war.
From this point, the two Anean nations, one to the east and one to the west, embarked on different paths.

On August 30, 2015, Estovakia invaded the neighboring nation of Emmeria, attacking its capital of Gracemeria in a bid to shore up the former's ailing economy. The Estovakian Air Force was temporarily outnumbered due to intercepting fighters, but the Aigaion's Nimbus missile attacks together with the Strigon Team's onslaught quickly turned the tide back in Estovakia's favor. Emmerian forces were forced to withdraw west all the way to Khesed Island. On November 24 that same year, the Estovakian Air Force attempted to annihilate Emmeria on Khesed Island with a bombing operation centered on several B-52s, but the operation ended in failure after every last one of the bombers was shot down by intercepting fighters. This is when Emmeria's counteroffensive began. On January 26, 2016, Emmerian forces finally returned to the mainland and launched a full-fledged military campaign to retake the territory it had lost. At the time, Estovakia still had overall military superiority, and in Silvat Town, the Emmerian Army's tank corps came close to being obliterated. Despite this and other setbacks, Estovakian forces there were destroyed on February 7 when the Emmerian Air Force came to the rescue. The Estovakian Air Force's Strigon Team, which had arrived to aid the country's ground forces, lost several aircraft.



ULYSSES IMPACT EVENT

The world's nations took measures to counter the threat posed by fragments of the asteroid Ulysses, which were set to strike the planet in 1999.
Estovakia built the Chandelier near Sonne Island, which is located in the Razgriz Straits north of the Anean continent. Much like Stonehenge in Usea, it was a massive railgun system meant to intercept and destroy the Ulysses asteroid. However, the gun barrel kept getting larger and larger with each test they conducted, while the development of a rotating base for aiming at the asteroid fragments became bogged down. Chandelier never became operational as an asteroid intercept facility, and as such, many Ulysses fragments struck the eastern Anean nation of Estovakia. This resulted in the collapse of the nation's economy. Emmeria, on the other hand, was left relatively unscathed by the impact event.

KINGDOM OF NORDENNAVIC

The Kingdom of Nordennavic is a perpetually neutral state that will side with neither Estovakia nor Emmeria.
With its cold climate and many lakes and forests, it can hardly be called a land of milk and honey, but it has a thriving machine industry and many of the world's leading corporations, including Macmillan Heavy Industries.

REPUBLIC OF EMMERIA

The Republic of Emmeria encompasses all of central and a large portion of western Anea, as well as Khesed Island to the west.
It is bordered by Estovakia to the east and Nordennavic to the northwest. Across the ocean to the south lies the continent of Verusa.
Emmeria has the most land of the three nations on Anea, and its population as of 2013 stood at 110 million.
It is a wealthy country possessing great economic clout and is also one of the world's leading military powers.

FEDERAL REPUBLIC OF ESTOVAKIA

The Federal Republic of Estovakia is a military state in eastern Anea.
Approximately half of Estovakian territory consists of mountainous regions, and its only land border is with the Republic of Emmeria to the west. The rest of the country is surrounded by the sea.
As of 2014, its population stood at 63.5 million.
The country plunged into civil war after it was struck by many asteroid fragments, laying waste to its economy and political establishment.
A military junta comprised of high-ranking faction officials, commonly known as The Generals, assumed power and established a military regime.

In this manner, Estovakia gradually began to lose its numerical superiority. On February 20, Estovakia's Aerial Fleet, which included the nation's trump card, the Aigaion, was in the midst of an aerial refueling operation, which degraded its radar capabilities, when the Emmerian Air Force struck and downed the entire fleet. After successive losses to Emmerian forces across the continent, Estovakian forces appeared to be headed for defeat. In a last ditch effort, they dug in at Gracemeria and readied to defend the captured Emmerian capital to the death. On March 26, the weapon of mass destruction, which was part of Estovakia's scorched-earth policy intended to make Emmeria think twice before attempting to retake Gracemeria, was destroyed by Emmerian Air Force 8th Air Division 28th Fighter Squadron, "Garuda Team," which had infiltrated enemy-held airspace in a covert operation. A large number of fighters were scrambled to eliminate Garuda Team, but they were all shot down by Emmerian Air Force fighters that arrived to provide air support. On March 31, Estovakia lost Gracemeria to attacking Emmerian forces and was forced to cede all the territory it had captured. During the battle, Strigon Team leader, Lieutenant Commander Ilya Pasternak, attempted to buy time for his subordinates to withdraw by launching a solo operation to harass Emmerian forces with a swarm of UCAVs along with his own aircraft. He was later shot down and killed, but his subordinates completed their retreat. Despite the fact that negotiations for a ceasefire were underway between the leaders of Estovakia and Emmeria, members of the Estovakian military who were against peace talks gathered to plot a final counteroffensive. On the night of March 31, a large number of cruise missiles were fired at the city, but were shot down in midair by patrolling fighters. Later analysis revealed that the missiles were launched from the Chandelier system that was built to prevent the impact of Ulysses in 1999. In the predawn hours of April 1, the Emmerian Air Force set off for the Arctic Ocean in a bid to achieve peace for the country and break the tragic chain reaction that Ulysses had triggered. That same day, Emmerian forces destroyed the Chandelier just as the sun was rising, although they suffered a substantial number of casualties. And so it was that the war came to a close. After the war, the military regime was overthrown by a coup in the Estovakian capital.

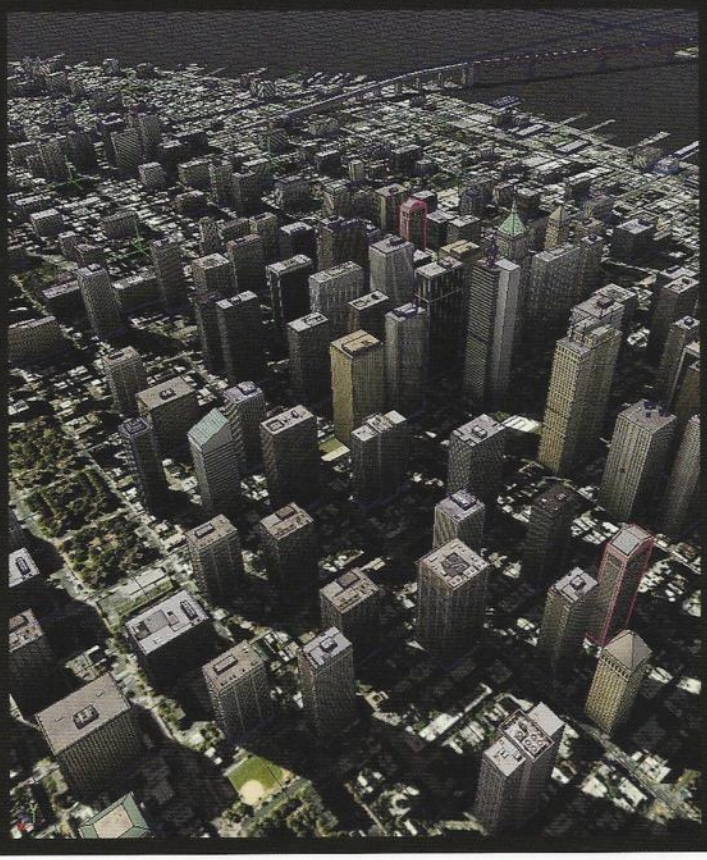
Gracemeria, Capital of the Republic of Emmeria

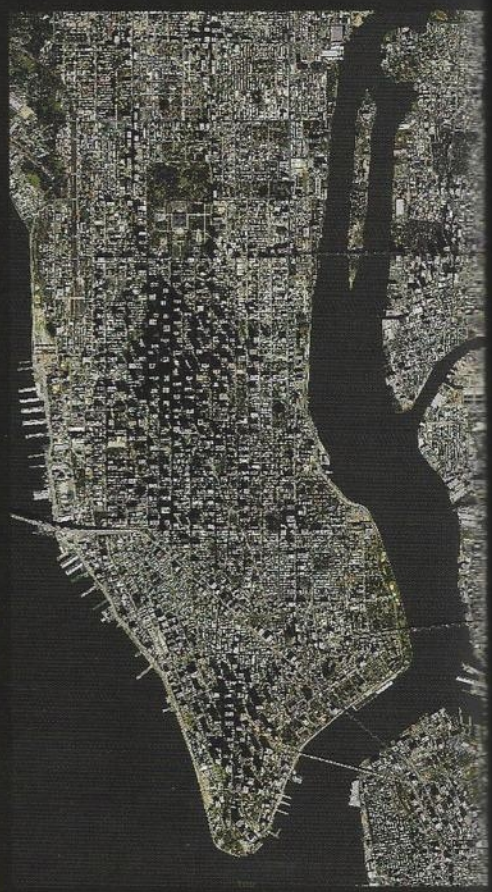
The capital city was relocated when the nation first became a republic. It is also known for the famous King's Bridge, which links Old Town to the west with New Town on the opposite side of the bay.

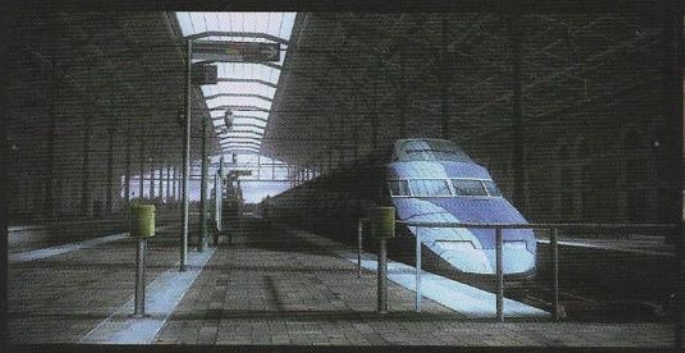
Gracemeria is one of the most highly developed metropolises within Emmeria, as well as the entire Anean continent itself.

Gracemeria Castle, which stands on a hill within Old Town, has many valuable and culturally important items on display, including a statue of the Golden King. The underground shelter built to take advantage of the castle's structural stability accommodated over 15,000 evacuees during the Ulysses Impact Event.

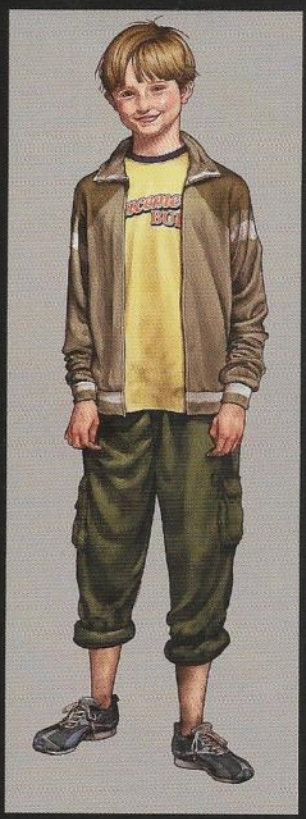
With its fertile land and key location on major transport routes, Gracemeria has suffered a history of warfare, both internal disputes and foreign invasions, for control of the city. As a result, there were periods where the city descended into lawlessness, sowing chaos throughout all of Emmeria.



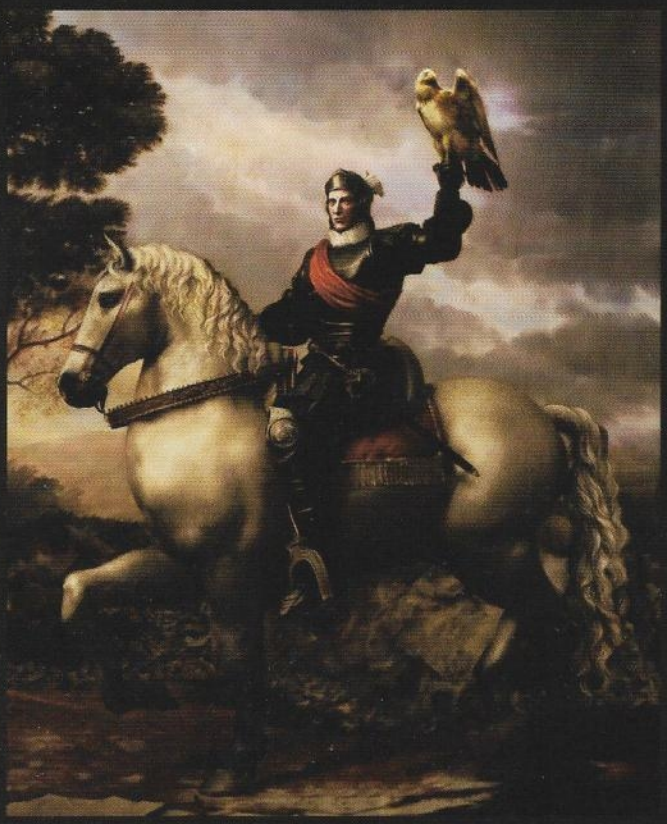




Sergeant Louis McKnight and his compatriots, who had gone missing in the San Loma Assault on February 15, were the first to inform the people that Gracemeria had been liberated. They were near the site of the March 26 operation to destroy the WMD catalyst, and at that time, they picked up the civilians Melissa Herman and Ludmila Tolstaya while heading to Gracemeria.



EMMERIA-ESTOVAKIA WAR 08.2015–04.2016



EMMERIA-ESTOVAKIA WAR

08.2015–04.2016

"The King and His Falcon"
Portrait

Melissa Herman
(Age 32)

Born and raised in a wealthy family, she later married an Emmeria Air Force pilot. She was a bit unhappy about her husband's absence due to his military duties, but she led a peaceful and happy life with her daughter in a wealthy neighborhood in Gracemeria. That is until she lost her daughter in a sudden bomb strike, or so she believed...

Matilda Herman
(Age 9)

The only daughter of Melissa Herman.
She is active and energetic as opposed to her mother who is more refined and ladylike. Although she is impertinent at times, she has a good relationship with her mother, almost as if they were friends.
She got caught up in the chaos of war while on an elementary school field trip.

Victor Voychek
(Age 41) Rank: Lieutenant Colonel

Leader of the Strigon Team, an elite squadron comprised of former Estovakia Air Force pilots. He was shot down over Gracemeria, leaving him with a crippled leg. This put an end to his flight career and led to his reassignment as a ground-based intelligence officer.
But he has never lost the desire to once again soar through the sky. Voychek is an intensely loyal military man, but he has the kindness and wisdom that allows him to sympathize with innocent civilians on the enemy's side.

Louis McKnight
(Age 33) Rank: Sergeant

McKnight is the central figure in a three-man Emmerian tank crew. Though he acts flippant, he is an exceptional military man, the type that survives battle after battle with his optimistic attitude and quick thinking.
He later rejoins his tank regiment, but by that time, he had already developed a distaste for war. One day, Donnie Torch said something that kindled his weary heart.

The Golden King

The Golden King was created by the medieval hero King Aurelius II based on ancient legends told on the Anean continent of a war god known as the Golden Giant. The land surrounding Gracemeria has been known to be fertile since ancient times, and the battles Emmerian lords waged over its control laid Gracemeria to waste, plunging it into lawlessness. This left the nation open to foreign invasions, resulting in a serious erosion of royal power and chaos throughout Emmeria. It was Aurelius II who stood against the foreign invaders and put an end to the conflict. The statue of the Golden King was created to raise ally morale, and the troops that carried it in their ranks were invincible. Upon beholding the statue, their enemies would lose the will to fight. There came a point where they would often win without fighting at all. Ultimately, Aurelius II persuaded the various Emmerian lords to submit to his rule, thereby forming a united front against foreign invaders and putting an end to the constant warfare. This story was cited in the declaration of Emmeria's establishment as a republic.

Ilya Pasternak
(Age 35) Rank: Lieutenant Commander

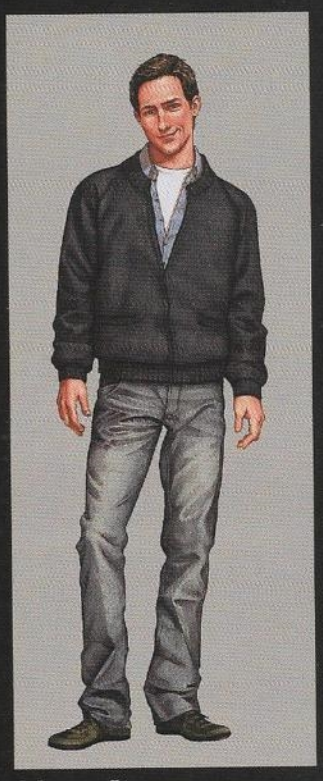
An Estovakian fighter pilot who once served as Victor Voychek's trusted confidant and second-in-command of the Strigon Team, a squadron of elite pilots in the Estovakia Air Force. As the flight commander of another elite squadron, he sees action all over the map. He willing plunges headlong into danger to help his comrades and is always cool as a cucumber no matter the situation. This makes him a beloved figure among his subordinates and a hit with the ladies.

Toscha Mijasik
(Age 26) Rank: First Lieutenant

Civil war broke out in Estovakia while he was in high school. He volunteered with the military in an effort to protect his hometown from the ravages of war. It was during this time that he joined the Strigon Team after exhibiting his innate talents as a fighter pilot. He participated in the attack on Gracemeria at the outset of the war with Emmeria. Like many of his comrades, he is a young, conflicted ace pilot who volunteers for air combat duty but is caught between a sense of duty that makes him willing to sacrifice his life and the anxiety that comes from risking his life in battle.

Ludmila Tolstaya
(Age 23)

This Estovakian woman drove alone from the Kingdom of Nordennavic, a neutral nation, all the way to Gracemeria, the capital of Emmeria. But what purpose could she possibly have in Estovakian-occupied Gracemeria?
She is a riddle wrapped in a mystery inside an enigma. Word has it her lover is a fighter pilot.

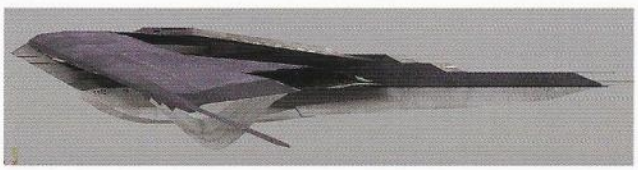


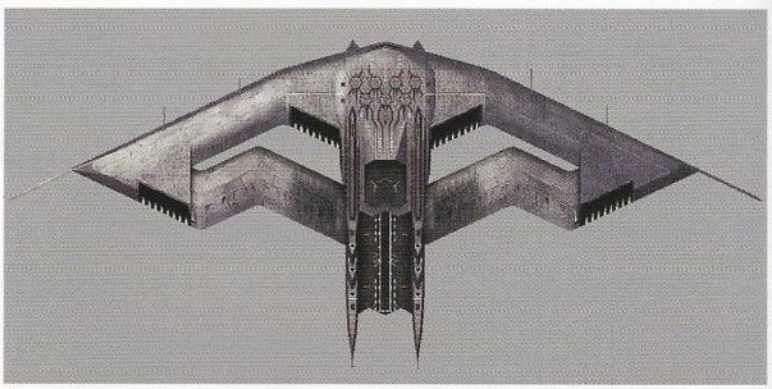
Marcus Lampert
(Age 35) Rank: First Lieutenant

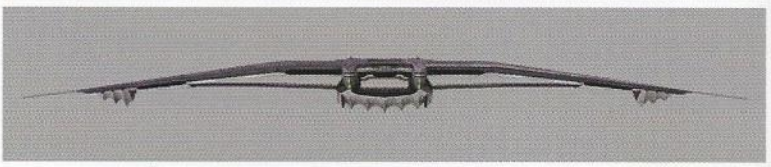
A combat pilot in the Republic of Emmeria Air Force. His call sign is Shamrock. As a member of the Eastern Air Region Air Defense's 8th Air Division responsible for defending the skies over Gracemeria, he is hastily recruited as the second plane of the 28th Fighter Squadron, a.k.a. Garuda, during a surprise attack. From that point on he serves as the player's trusty partner in a series of battles. In peacetime, he is a loving husband and father. Amid the chaos and destruction of the war, he becomes concerned for the safety of his wife, whom he has not heard from for some time.

P-1112 Heavy Command Cruiser Aigaion

Width: 963.77 m, Length: 433.3 m, Height: 102.39 m, Engines: 24 special engines.
This massive aircraft forms the core of the Aerial Fleet Initiative. Carrier-based aircraft can take off, land, get services, and refuel on board as if it were an air carrier.
It is also armed with Nimbus long-range cruise missiles. They can be launched continuously from the top of the aircraft, decimating enemy targets from afar. The Aigaion's huge size makes it vulnerable to close-range attacks, but its highly advanced radar detection capabilities and air defense system utilizing Nimbus missiles makes it very difficult for enemy aircraft to get anywhere near it. This huge size also renders it incapable of takeoffs and landings on normal runways, which is why it repeatedly refuels in the air and flies at extremely high altitudes. It falls under the naval jurisdiction, and during maintenance, it lands on the ocean like a seaplane.
During the Estovakian Civil War, the Aigaion was deployed on a test basis in the final battle against the Lyes United Front. Since her sister aircraft, the Kottos and Gyges, were not yet finished, the aerial formation was incomplete, but with its long-range attack capability using Nimbus cruise missiles and coordinated efforts with Strigon Team, it performed far beyond expectations, delivering a win against the Eastern Faction.
The completion of the Kottos and Gyges did not come until after the civil war, so the first deployment in full operational formation did not come until the Invasion of Graceneria.







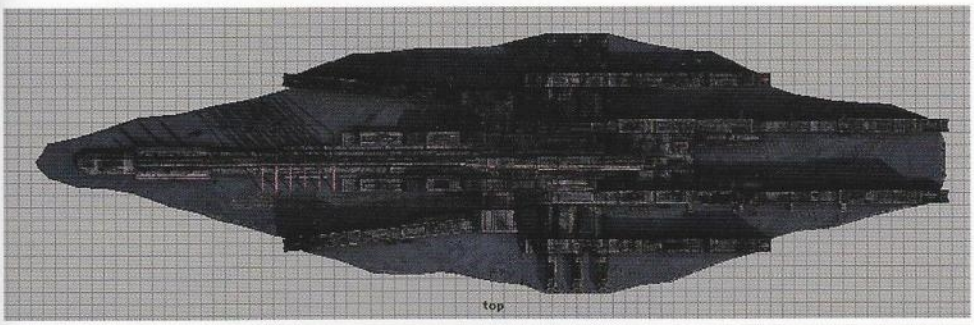
Chandelier Railgun

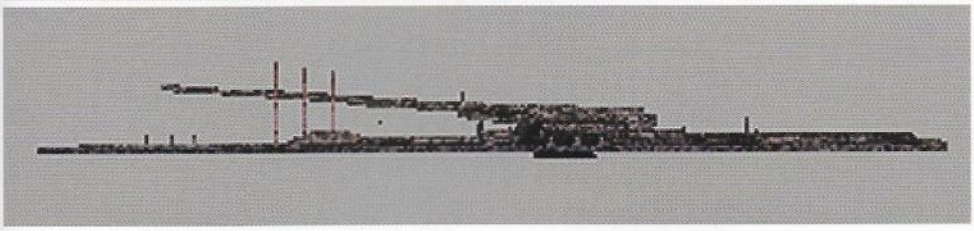
The Federal Republic of Estovakia originally intended the Chandelier to be an asteroid intercept system to counter Ulysses. Its principal application was to be the destruction of the asteroid's fragments by firing giant missile-carrying capsules known as Stauros. After the railgun performed a high-speed launch, the missiles were to fire once the capsule was close enough to their target. However, the gun barrel kept getting larger and larger with each test they conducted, while the development of a base for rotating it became bogged down. Ultimately, only a portion of the gun barrel was built before the project was halted.

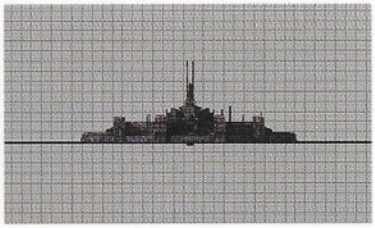
Work on the Chandelier resumed in the midst of civil war when the East Faction decided to put it to use as a weapon. The rotational issue was solved by employing an ice block floating on a 13.23 square kilometer glacier as the base and then using a magnetohydrodynamics (MHD) propulsion mechanism to allow it to rotate. The ice was blended with a special silicon polymer that gave it superior impact resistance and a high melting point. The MHD propulsion mechanism also enabled it to sail at a speed of 12 knots per hour. The Chandelier was initially completed in 2014 after the civil war ended, but it required a vast amount of energy to operate and had issues with its exhaust mechanism. Due to the frequent maintenance required, it was not used aggressively throughout the invasion of Emmeria. It only came into use as a trump card in the final stage of the conflict.

EMMERIA-ESTOVAKIA WAR

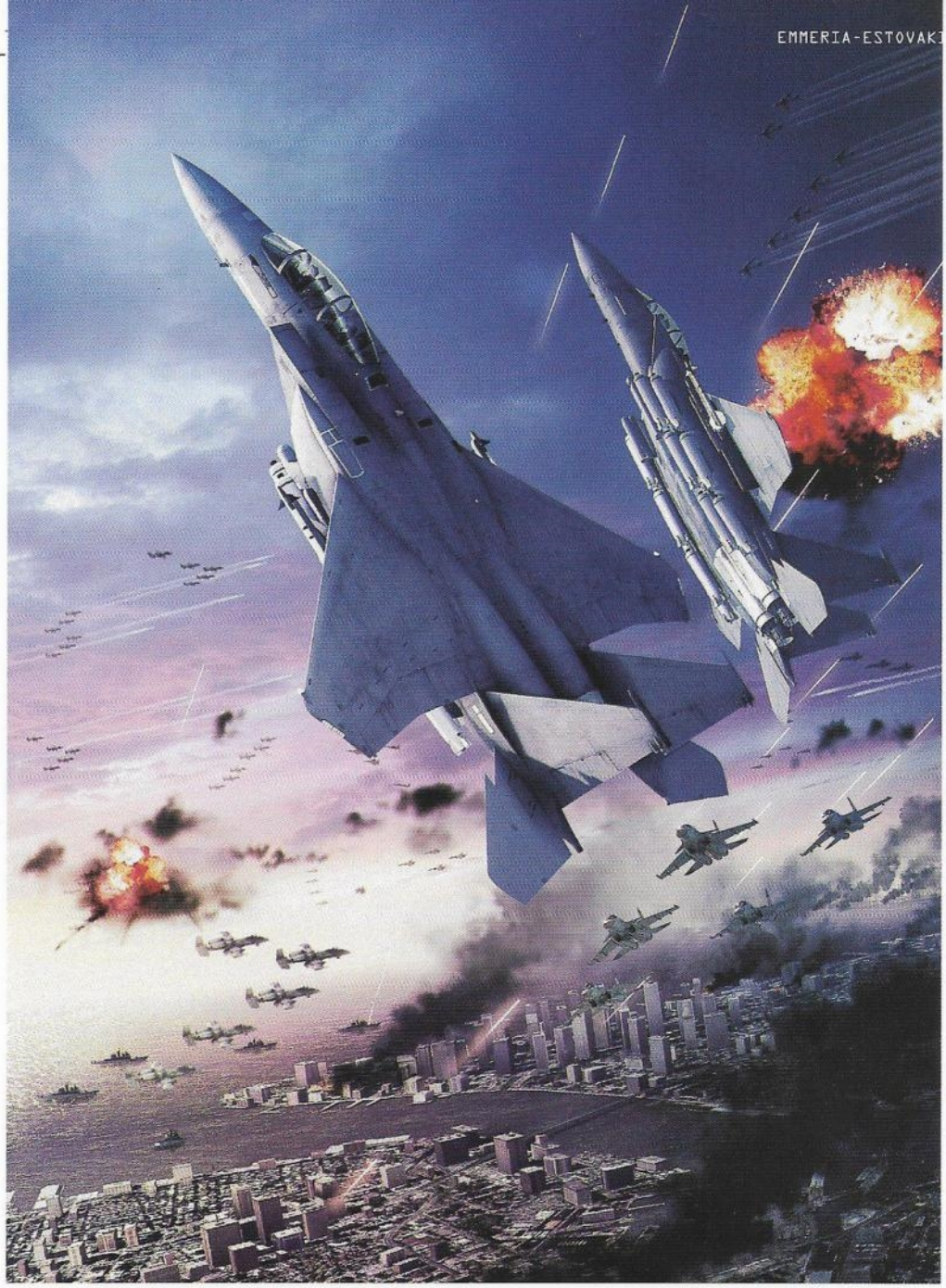
08.2015 – 04.2016







Emmerian Air Force 8th Air Division 28th Fighter Squadron Garuda
The emblem consists of the mythical bird Garuda with three red stars above its head.
The squadron defended the skies over Gracemeria, the capital of the Republic of Emmeria, during Estovakia's invasion.



CFA-44 Nosferatu

Overview	Role	Air superiority/Multirole carrier-based fighter	
	Crew	1 (pilot)	
Development launch		6/1/2005	
	National origin	Estovakia	
		(Albastru-Electrice and consortium of cutting-edge Estovakian firms)	
	Length	24.04 m	
	Width	14.58 m	
	Height	5.03 m	
	Weight	Plane only	18,500 kg
Propulsion	Engines	Two Marte-type 11s	
	Performance	Combat radius	1,360 km
		Max speed	Mach 2.2
Weaponry	Fixed weapons	Two anti-air machine guns	
		Malebolge autonomous UAVs	
		Inferno all-direction multipurpose missile (ADMM) launcher	
		Purgatorio aircraft-mounted small railguns	
		Cocytus ECM/ECCM unit	
		AIM-9X Sidewinders	
		R-73 Archers etc.	

REPUBLIC OF EMMERIA AIR FORCE UNITS INSIGNIA

Emmeria Air Force
28th Fighter Squadron
"GARUDA"

Emmeria Air Force
8th Air Division

Emmeria Air Force
4th Company "SERVAL"

CFA-44 Nosferatu

The CFA-44 is a next-generation stealth carrier-based fighter developed by the Federal Republic of Estovakia. Initial plans called for it to be deployed in the Aerial Fleet that centered on the Aigaion, but development issues led to only a few being experimentally deployed at the beginning of the Emmeria-Estovakia War.

The exact origin of the nickname "Nosferatu" is debatable, but it is popularly accepted to be based on a synonym of vampire. The CFA-44 was developed under a national project in which several firms participated. At the center of the project was the state-run firm Albastru-Electrice. Its ambitious design includes integrated sensors covering the entire plane and a "cloud shooting" feature in which a seamless datalink is made with multiple autonomous "Malebolge" UAVs.

Based on threat information sent by the Malebolges, the CFA-44 plays the role of an aerial arsenal ship that counters with the optimal weaponry.

The Malebolges can also confuse enemy air-defense radar by mimicking the CFA-44's radar reflection, and they are armed with a machine gun, but offensive attacks are not its primary role.
However, alternate solutions are being considered to reduce weight, including using an electron beam system. The Malebolges can also fold up and be stowed in the CFA-44's weapons bay.

The CFA-44's stealth coating employs porous ceramics to achieve advanced stealth capabilities. It is lighter and more durable that the conventional coating, and its formulation can be modified based on the special characteristics of the enemy's radar, thereby enhancing stealth performance.

The control system uses fly-by-light, which is resistant to electromagnetic interference, but maintenance issues remain.
The plane's weaponry is highly distinctive, and its all-direction multipurpose missile (ADMM) launcher is an exceptional weapon that can simultaneously attack 12 targets, although its range is short.
This weapon proved extremely useful during the civil war.
Small railguns are equipped in the left and right weapon bays on the rear portion of the plane, and the weapon bay on the plane's belly is equipped with a battery unit that is capable of rapid fire to a certain extent.

Use of the ECM pod renders the plane's advantageous stealth ineffective, but it emits a powerful beam that can burn the sensors on enemy missiles and the eyes of enemy pilots.

This project was a massive drain on Estovakian finances, especially after the destruction left in the wake of the asteroid Ulysses. The mass media ridiculed the plane's nickname Nosferatu by saying it really was like a vampire sucking precious taxpayer money from the nation. However, under the East Faction's rule, there was no freedom of speech in Estovakia, and many journalists went missing.

The Emmeria-Estovakia War claimed countless lives, decimated Estovakia, and sent its Aerial Fleet, a symbol of their national strength, to the bottom of the ocean, but the Nosferatu lives on, as it continues to be manufactured and deployed in small numbers.

FEDERAL REPUBLIC OF ESTOVAKIA AIR FORCE UNITS INSIGNIA

ESTOVAKIA AIR FORCE
9th Tactical Fighter Squadron
"STRIGON"

ESTOVAKIA AIR FORCE
370th Aviation Regiment

"Coat of Arms"

"Reply to Reader Letter"

This is the first time I've received a letter from a reader, so I'm somewhat nervous.

Thank you for offering your thoughts on my modest fairy tale. Very few copies of that book were printed, so it was really more of a private edition.

To be honest, the depth of what you expressed made me feel my right to discuss literature is lacking. For quite some time, there was only one story that truly mattered to me. It was my sole foundation. Other than that, my living has had nothing at all to do with such things.

That book was the only product of my decision to step into a new frontier and take up writing.

"Reply to Reader Letter"

This is quite a surprise. I never expected another letter.

Yes, as you wrote, the only book that truly mattered to me for quite some time was A Blue Dove for the Princess.

It drew me in, and I practically lived inside the story.

And, as you can imagine, I kept thinking about what became of the fruit that was brought back to the princess. I had visions of the seed inside sprouting, then growing into a tree, and finally bearing fruit of its own as people gathered under its branches. It would be a happy future. As you have written, I wanted to cast away the gloom and enjoy a bit of light, no matter how meager.

SHORT STORY

AFTER THE BLUE DOVE

"Reply to Reader Letter"

I must admit that I am astonished.

The one person who found my poor excuse for a book on the shelves of a shop, read it, and went as far as to write its author was in fact an editor. I never would have imagined such a thing.

I am very grateful for your offer to have my fairy tale released by a major publisher.

However, the other idea you wrote about, trying to write a sequel to A Blue Dove for the Princess, is a bit difficult for me.

I appreciate the thought, but there is a thorny problem. I do not possess enough light within me to share with others. I have been in military service. The situations I went through in the war were quite intense. Now I myself am an exhausted dove.

"Manuscript"

Author's afterward for the reprint of The Twelve Colors of the Sky

The sky has no outline. It has no shape. That's why I was able to dwell there.

I finally realized that there was color to the sky.

The sky expresses itself with different colors, and these fade as you gradually move away from the surface, until there is no color left, leaving jet black studded with stars.

Standing before that, I feel far from everything. Isolated.

It's lonely, but calm and tranquil at the same time. I wish those moments could last forever.

Lowering my eyes from the stars and looking back, I see the ground stained blue. Countless people have covered the planet in the fruits of their labors and excuses for their conflicts.

"E-mail from Editor to Writer"

I have received the afterward you wrote for the reprint of The Twelve Colors of the Sky. It is quite refined. It's clear you have every right to discuss literature. There's something special in you. I believe it's what I've sought most of all as an editor.

You sent a biography to be added to the book earlier.

To be frank, though, it's difficult to grasp, and I don't feel it let me know you better.

On that note, we haven't had a chance to meet face to face. I'm afraid I've built up quite an image of who you might be. That's not a problem, is it? I am an editor, and you are the writer I've been looking for, because your work is the first I've seen that has truly satisfied me. So I was looking forward to reading your biography. At least until I picked it up.

However, I think I found you in the afterword you wrote next.

Allow me to write what I imagined.

You were in the air force during the war.

No, I don't mean to be presumptuous.

The thing is, I was in the army at the time. I wasn't engaged on the front lines or anything. I was just on a PR team under group command. I wasn't with the first wave when they hit the shores of the Yuke mainland, nor did I witness Cruik Fortress as it spat fire. I sat on base and edited documents that came in from the field.

Day in and day out, I handled names and numbers that appeared in reports. These were for the news. Countless reports. An endless stream of them. Sometimes they were as small as the population of a village, and other times they were far larger.

I wanted to think of them as nothing more than statistics. Considering them anything more would be unpleasant. Then one day, something truly unpleasant happened. There was meaning in one of the names that crossed my desk. It belonged to my older sister's husband.

Suddenly I heard sound in my ears: the crying of the baby that had been born between them and that I had held so many times. It was so loud.

After that, the meaning of the names and numbers appearing in the reports became naked to me.

"I am someone's son."

"My mother raised me with love."

"I left my hometown sweetheart behind."

"Our second child was about to be born."

The thoughts kept unfolding in my head and left me rather crazed.

However, the worst of it was, yes, going back and continuing to do my job the next day. And the day after that. And the day after that.

I couldn't change anything I did. It was like that until the war ended. It left me a ruin.

Thus, I started working on children's books in search of a tomorrow.

Forgive me. I was trying to paint a picture of you, but I only went on about myself.

"E-mail from Editor to Writer"

Do you really want to meet somewhere and talk about work? I'm thrilled! Is coffee all right? I know a nice shop that has some rather unique coffee and cakes.

"E-mail from Editor to Writer"

Kei, the moment I saw you approach the tree-shaded open terrace, I knew it was you. You looked exactly how I imagined.

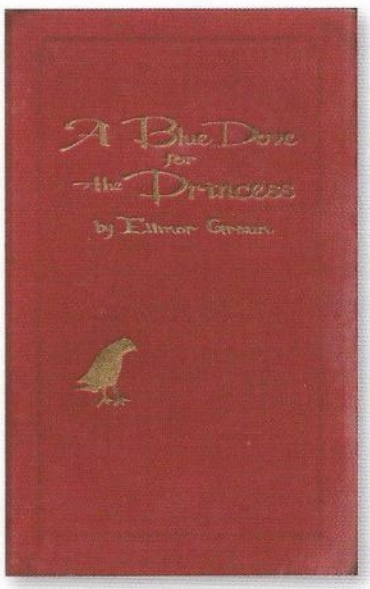
When you saw me, you immediately noticed my unusually large belly. I noticed a bit of anxiety on your face.

"When that baby is born and begins to cry, will that woman be able to handle it?"

"E-mail from Writer to Editor"

Congratulations. I'm relieved to hear both you and your baby are in good health.

By the way, is it safe to assume that the man who telephoned me is your husband? He was rather flustered and forgot to introduce himself.



"E-mail from Editor to Writer"

It took some extra time because of me, but your fourth book is finally on the shelves. Congratulations. Our girl is a little darling that causes us no trouble at all. Thanks to her, I've been able to focus on my work. It will be her first birthday soon.

By the way, we plan on holding a party for her. It will be a small family gathering, but I would like you to attend as a guest so that you can meet little Mia.

"E-mail from Writer to Friend"

And so I was invited to a perfectly ordinary household. I brought a bouquet of flowers as a gift. It was a pleasant experience.

I met her husband for the first time. He was in a panic when he announced the birth of their child in his wife's stead, but when I met him, he was warm, gentle, and quite at ease.

He attributed his relaxed manner to his profession. Patience is fundamental to being an astronomer.

One other person who gathered around the birthday cake was her husband's father, another gentle astronomer. When he was introduced, it was a name I was quite familiar with. He was Professor Jonathan Payek, who was working at Seals Bridge University in October 1994, the man who first discovered Ulysses 1994XF04.

Of course he is guilty of nothing, but it was still somehow difficult to accept that the kind-faced, bespectacled man standing next to me was connected to the war and the chaos it brought.

The Payeks, father and son, told me about their continuing work together in observing near-Earth asteroids and calculating their orbits.

"Have you observed anything interesting lately?"

An uncomfortable silence followed my question. The pair gazed into the flame atop the candle of the birthday girl's cake. They did not blink.

At that moment, I understood the meaning of what you offered me, Mr. Harling.

Another asteroid is approaching, isn't it? It's coming for Earth.

I thought that my wings had been clipped for good, but you gave me a chance to train as an astronaut. The starry sky called to me, but I had lost sight of what it means to fly.

Mr. President, the spacecraft I am to captain is to fly on a mission to destroy that asteroid, isn't it?

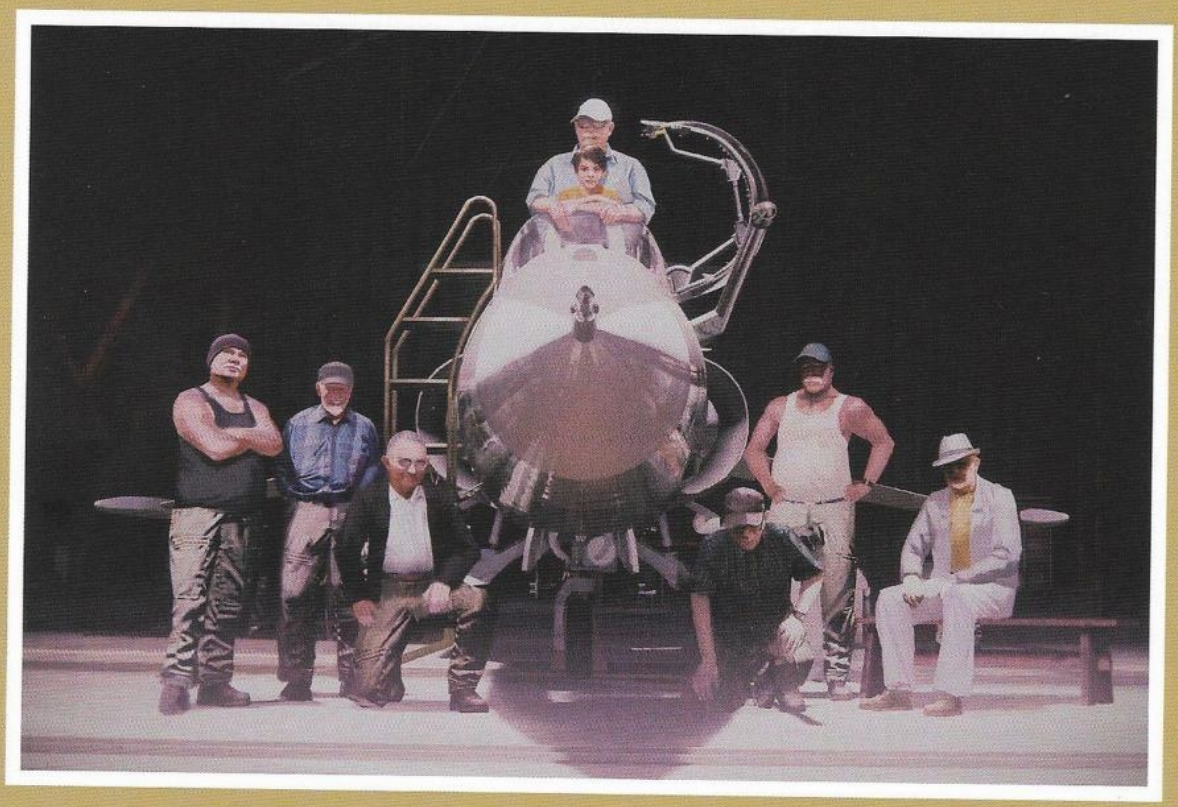
You thought I would hesitate.

I will not. I will keep little one-year-old Mia and her happy family safe. I understand how important this is.

By the way, the baby's name means "mine." It's an expression of how much her parents treasure her. Those astronomers deserve some relief. The burden of blame for ruining the world is not something they should bear.

"E-mail from Writer to Editor"

My fifth book looks like it will be my longest work by far. I will be spending a lot of time in a confined space, after all.



Military Veterans

Osea's disarmament plans brought on by the last great war forced many soldiers into early retirement. However, some of them never forgot the call of the skies and held drag races with machines assembled from parts purchased on the black market. The photograph above is a group of former Osean Air Defense Force officers gathered in honor of one of their superiors.

Warning:

The following pages cover the war known as both the Second Continental War and the Lighthouse War.

THE OSEAN FEDERATION

After the end of the Pacific Rim war in 2010, this Superpower became the leader of the international order. While promoting the restoration of relations with Yuktobania, which was the postwar, hostile country, they dispatched military to conflict areas caused by the Ulysses disaster and established stationed troops for the purpose of security maintenance activities under the authority of IUN.

KINGDOM OF ERUSEA (ERUSEA REPUBLIC)

After the Continental War, the Erusea Republic, which owned the largest national land area in the Usea continent, organized the interim governmant and restored Imperial rule. Although, 40 percent of the territory was handed back to neighbouring countries by military trial and retention of a defence-only military was permitted in order to accept Ulysses refugees, and supporting activities.

Section #05

LIGHTHOUSE WAR

05.2019 – 12.2019

After the Continental War ended in 2005, the Federal Republic of Erusea had a provisional government for three years. Following this, a plan was put in place to restore the royal family to power in a bid to speed the nation's reconstruction following its defeat. As a result, the republic was abolished, and the country once again was christened the Kingdom of Erusea. In response, the IUN deployed its International Union Peacekeeping Force across Usea to monitor the ceasefire. Peacekeeping troops were also stationed in former Erusean territory, including the Gunther Peninsula, which the IUN was governing as a trust territory. More than half of this force consisted of Osean troops. The Kingdom of Erusea and its surrounding countries grew increasingly frustrated by the hostile actions of the peacekeeping forces and environmental damage being caused to Gunther Bay by the Osean-led construction of the space elevator. Numerous demonstrations were held, calling for all ties with Osea to be severed, and there were a number of clashes between protestors and peacekeepers. Within the Erusean military, a group of young nationalistic officers called for war.

On May 15, 2019, the Kingdom of Erusea declared war on the Osean Federation. Immediately after the declaration, a swarm of fighter drones was unleashed from shipping containers on Erusean ships anchored in ports across Osea. The drones carried out pinpoint strikes against aircraft carriers moored at naval ports, while also attacking the peacekeeping force base near the Gunther Peninsula, putting it out of commission. This all happened with zero harm to the civilian population. The war's opening attack exceeded all expectations thanks to the drones' revolutionary technology. And with the princess speaking out against Osea's actions, public opinion tilted greatly in favor of Erusea. Even the opportunistic conservative faction within the Erusean military got on board. Moreover, Erusea would be able to seize the Arsenal Birds now that the space elevator was in their hands. They introduced the drone program they had been developing for some time and quickly shifted to operational deployment.

As a result of this opening attack, the Osean military lost its ability to cross the ocean, leaving the peacekeeping force to head into war without additional support from the Osean mainland. Erusean forces managed to drive the peacekeepers and the Osean forces stationed in Usea eastward, further restricting their movements. Erusea then deployed a drone-based auto-intercept system wherein any unidentified aircraft crossing the outpost line stretching north to south across the continent would be attacked. The Osean forces stood no chance unless they took out Erusea's early-warning radars, so the top brass devised strategies to quickly bring about an end to the war. The first required forming a long-range strategic strike group that could get past the Arsenal Birds' warning network and directly strike the capital. The second called for the analysis of the auto-intercept system's radar network. A unit from Zapland's airbase in eastern Usea participated in the latter mission. This penal unit consisted of war criminals who were given dangerous missions as punishment for their crimes. After discovering a hole in the radar network, Osean forces immediately commenced a long-range strategic strike. Successive waves of attacks struck key points from the north of the continent. On August 19, they successfully destroyed the first Arsenal Bird, significantly reducing the defense network's reach. Then on September 19, total war broke out when the two sides clashed in the capital of Farbanti. At the same time, Osean forces carried out a mission to destroy the military satellites that Erusea had hacked. However, Erusea simultaneously also took out all of the military satellites still under Osean control, causing the entire communications network to go dark. Both sides found their forces instantly isolated across the entire continent. With the chain of command severed and no way to obtain reliable information, rumors both true and false began to spread. Forces on both sides began splintering into different factions, and armed conflicts broke out across the continent.

An Erusean general from the conservative faction had been working secretly toward establishing a ceasefire, but he was assassinated in Anchorhead Bay on October 1. Meanwhile, a group of young pro-Erusean military officers who were advocating for the war to continue established their headquarters near the space elevator and started bolstering their forces with drone squadrons. The drones were unleashed from a facility near Gunther Bay and were joined by the Arsenal Bird to shore up defenses.

On November 1, forces that opposed the pro-Erusean military faction, including the Osean military, received a coded message across a few restored networks that instructed them to assemble in Gunther Bay. There they formed their own volunteer force without a chain of command and launched an all-out assault. The volunteer force ended up claiming victory with the destruction of the second Arsenal Bird.

In December 2019, Osea and Erusea signed a ceasefire treaty at the Expo City Conference. However, the smaller countries Erusea had annexed declared their independence and began mounting a campaign, and the nationalist movement rekindled, primarily in the north, causing tensions to mount. In response, the peacekeeping force made plans for a large-scale reorganization that combines troops from nations across Usea and gradually deploys them throughout the continent.

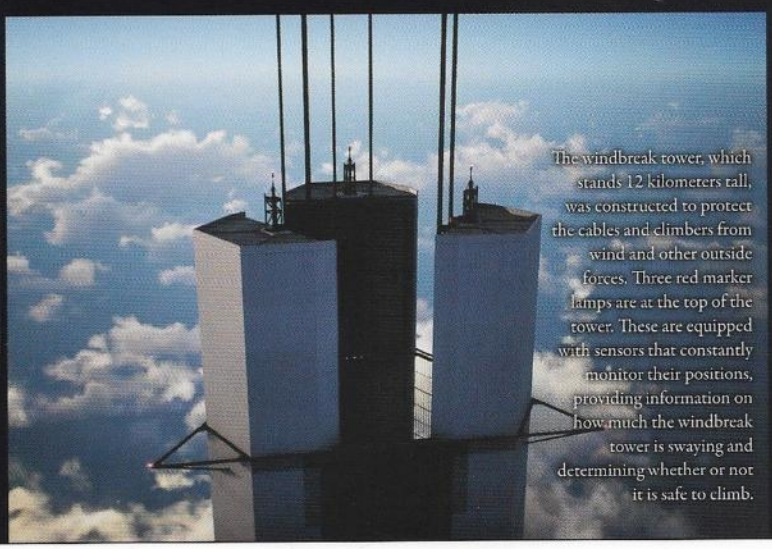
An expansive refugee camp was built at the base of the space elevator, and relief supplies were airdropped by transport planes arriving from Yuktobania and other nations. This was brought about at the urging of the Erusean princess, a leader who sought a more cosmopolitan world.

International Space EleVator

The ISEV (International Space Elevator) is a colossal structure built as a symbol of recovery after a devastating natural disaster.
Its cables stretch 36,000 kilometers into the sky to a solar power generation satellite.

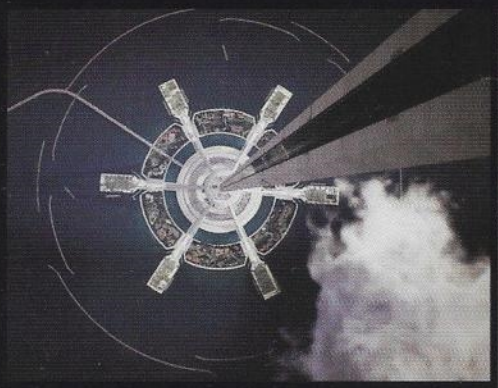
ISEV
INTERNATIONAL SPACE ELEVATOR

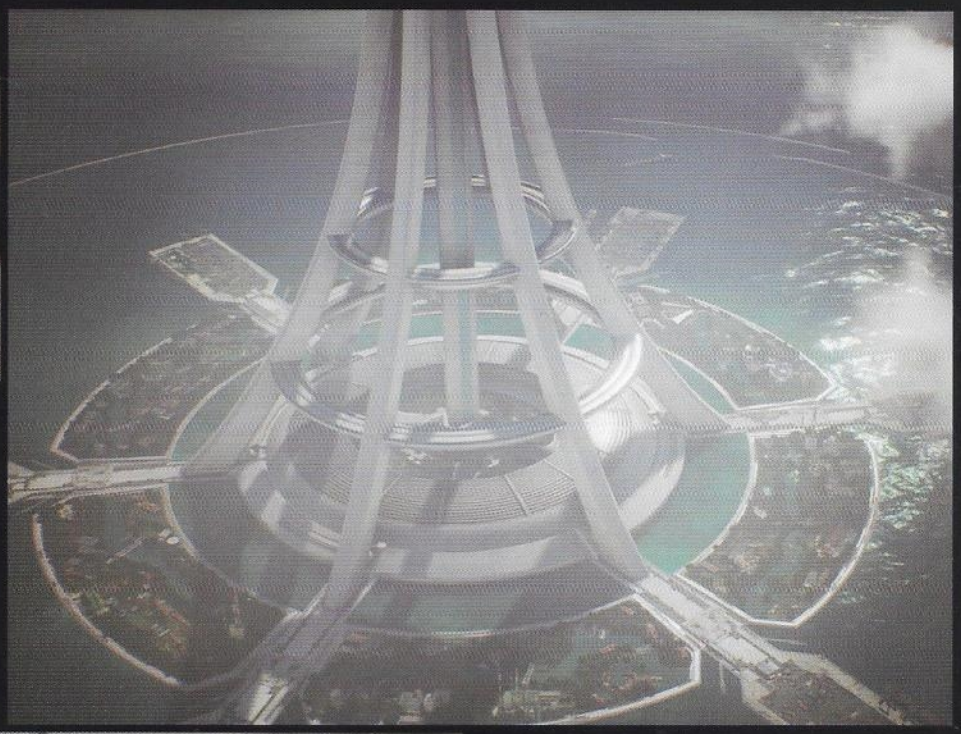
There are emergency escape decks every two kilometers along its windbreak tower. If a malfunction prevents a climber device from climbing the tower, or there is any sort of accident and passengers need to leave the tower quickly, they can escape to these decks equipped with parachutes that will carry them to the ground safely.



The windbreak tower, which stands 12 kilometers tall, was constructed to protect the cables and climbers from wind and other outside forces. Three red marker lamps are at the top of the tower. These are equipped with sensors that constantly monitor their positions, providing information on how much the windbreak tower is swaying and determining whether or not it is safe to climb.

The space elevator is built on the Earth Port, an artificial island about 20 kilometers from a port city situated on the equator. Materials and equipment were brought to the city and delivered to the artificial island across a long bridge. Selatapura, the city near the space elevator, has seen a great influx of trade and tourism since the project began.

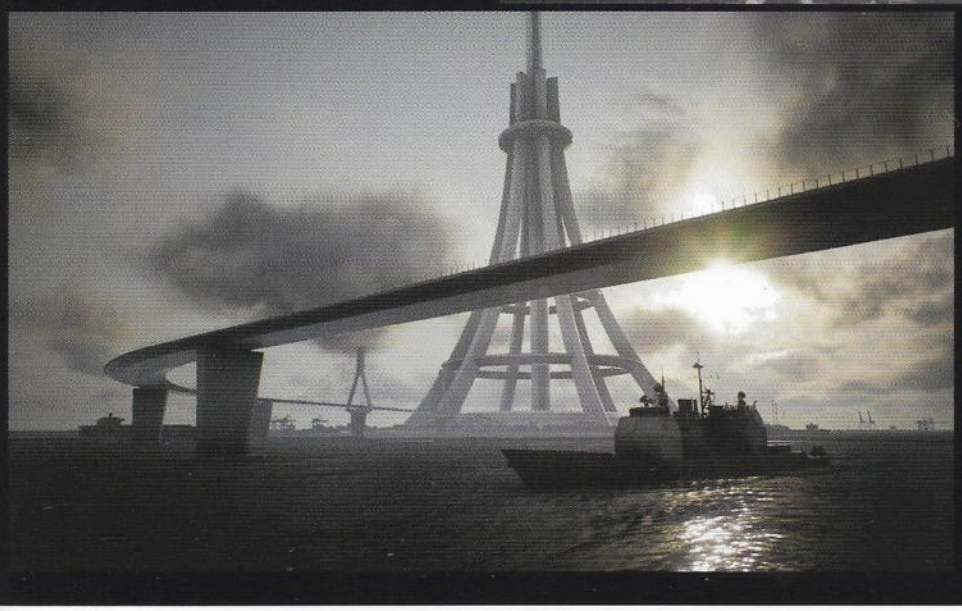




The Earth Port is an artificial island consisting of several different structures. It has cargo piers, a port of entry, management facilities, hotels, residential buildings, medical facilities, a windbreak tower, observation platforms, landings, and more.

The island is surrounded by a breakwater, protecting it from waves coming in. It also serves an additional function in reducing damage in the event that something falls from above. Gaps in the breakwater provide entryways for container ships.

The island does not float, but is stationary. Underground facilities utilize a crater created by the impact of the asteroid Ulysses, and the main shaft leads through it.



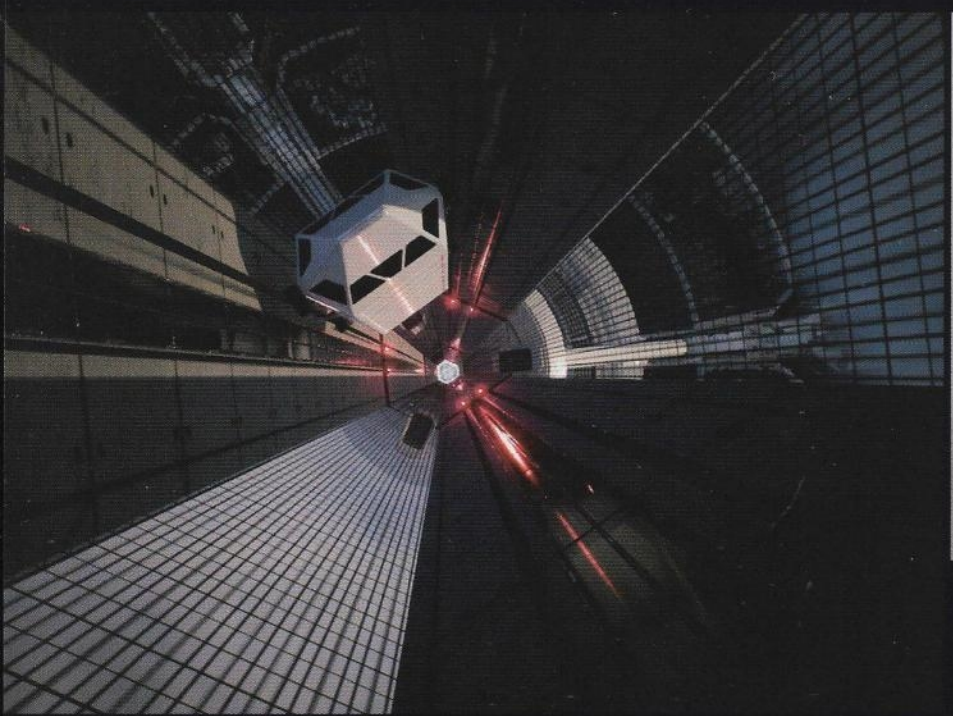
Ships and aircraft operated by IUN peacekeeping forces patrol the isolated Earth Port island to protect it from potential terrorist attacks.

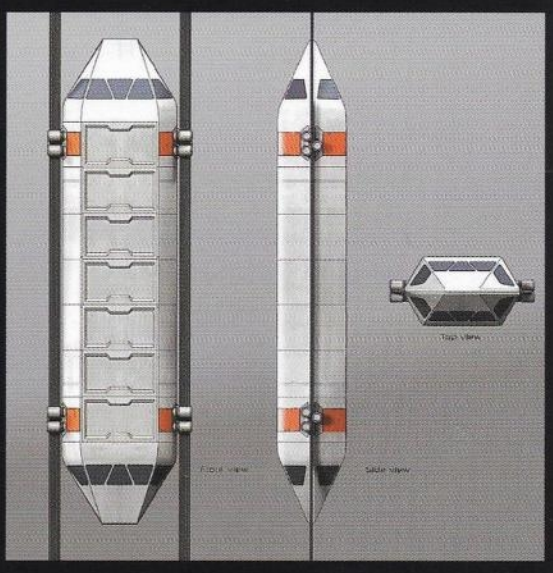
International Space EleVator

The arrival and departure floor in the Geofront underground facility houses a system that delivers cargo directly to the climber via a train that travels through an undersea tunnel.

LIGHTHOUSE WAR

05.2019 – 12.2019





There are six cables inside the windbreak tower, allowing three climbers to operate simultaneously.
Three sides of the hexagonal structure have glass windows, allowing passengers to enjoy the view as they ride.

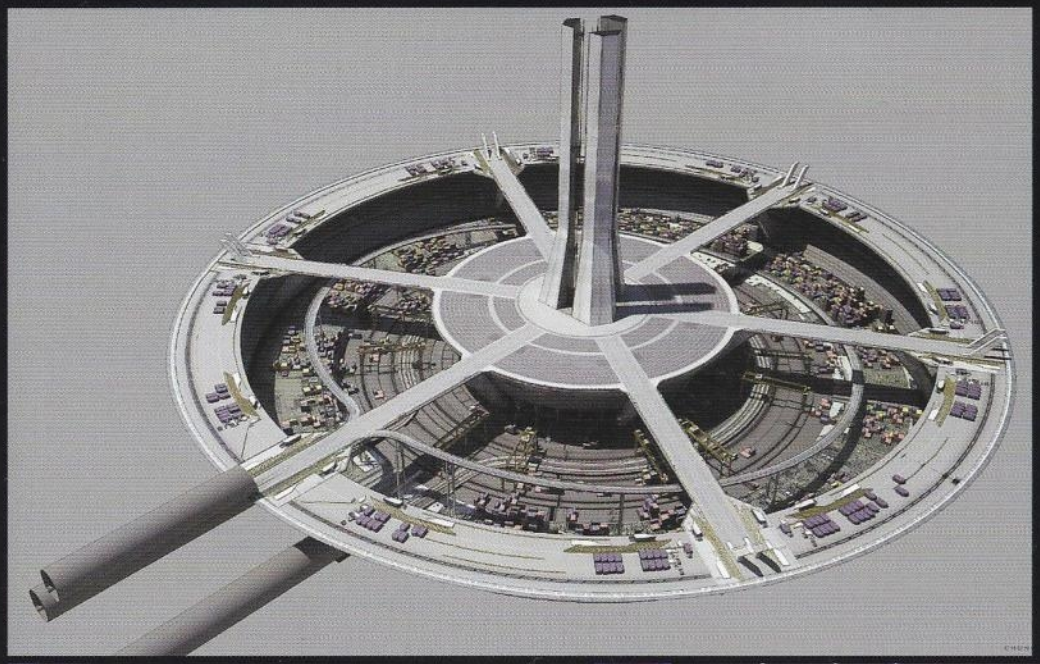
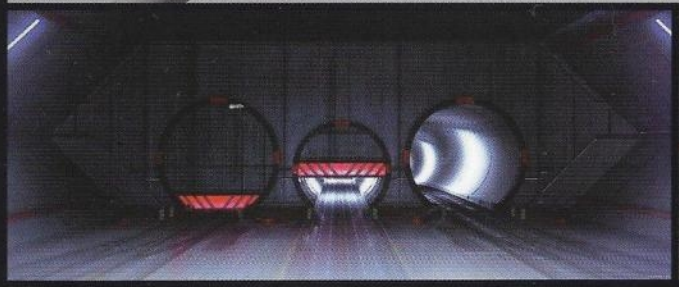
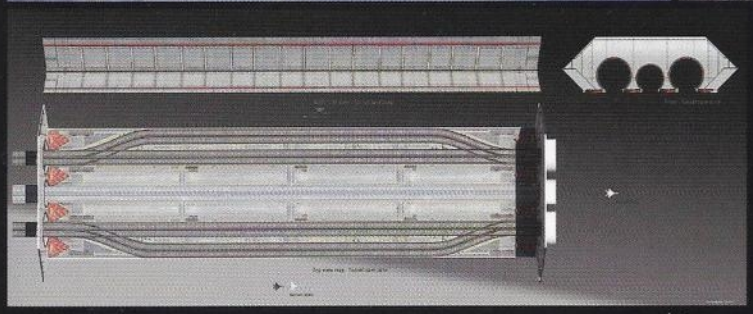
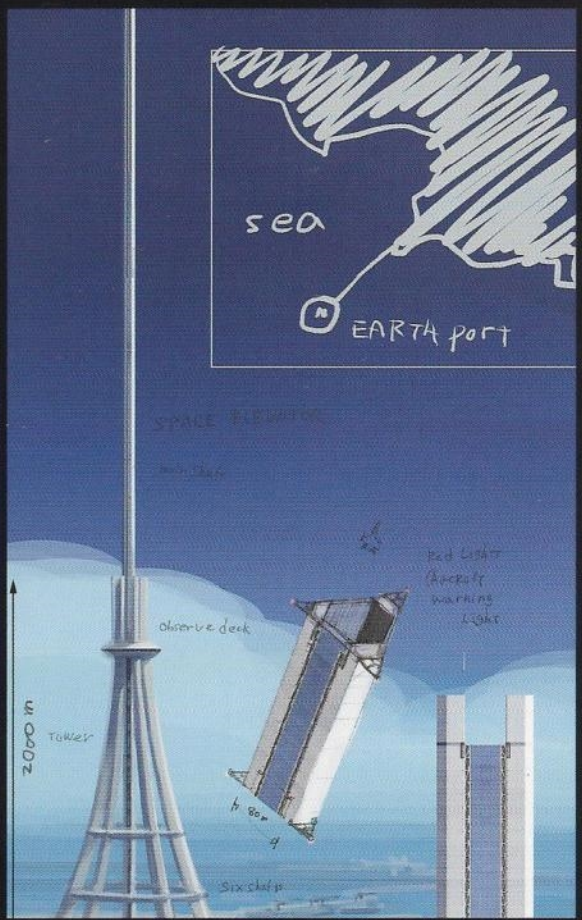


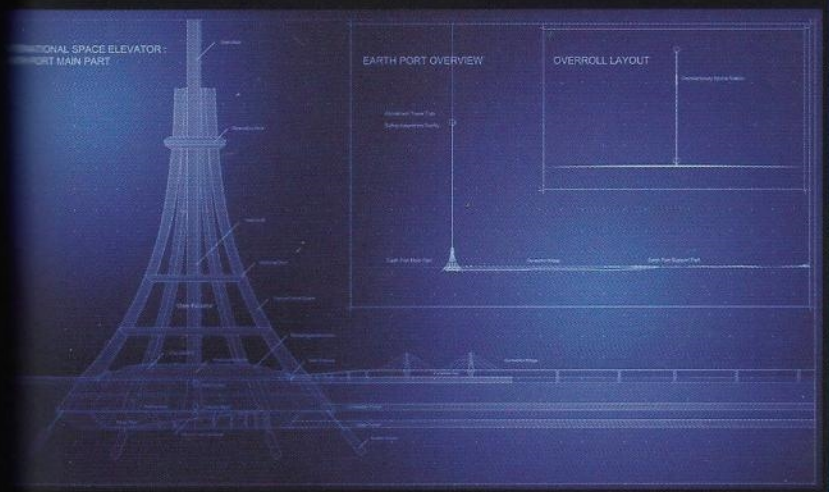
Diagram of the Geofront underground structure
When a fragment of the asteroid Ulysses impacted off the coast near Selatapura, it made a crater two kilometers wide.
The foundations of this structure used and expanded on this crater, and multilevel construction along with a fleet of automated gantry cranes allowed a vast amount of material to be quickly brought in and stored.



Seafloor tunnel entrance.
Large cargo is transported underground through a seafloor tunnel.
Safety shelters and watertight emergency shutters inside the tunnel minimize possible harm if flooding were to occur.







Side view of the space elevator. Sightseers can cross a bridge over the sea to get a closer look at the six pillars making up the tower that stretches up over the water.
Cargo to be lifted into orbit is brought in through a seafloor tunnel into facilities underground.
The figure on the right shows the Earth Port in relation to the city nearby, and the figure in the upper right shows the Earth Port in relation with the geosynchronous space station.

The Cutting-edge Lighthouse Guardians

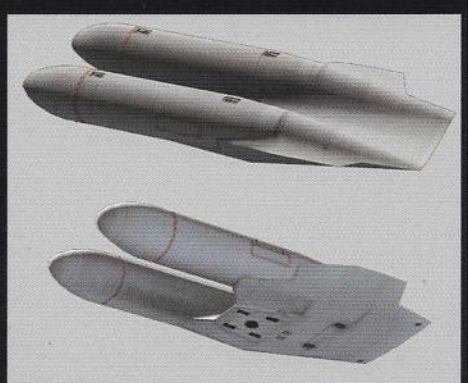
It was expected that the size of the space elevator would make it vulnerable to terrorism. Because of this, the importance of a fully secure defensive system was identi ed in the projects initial stages and became an integral part of the overall development along with the supply systems and the space elevator itself.
is meant that the ISEV would be equipped with the latest and most powerful defensive capabilities available.

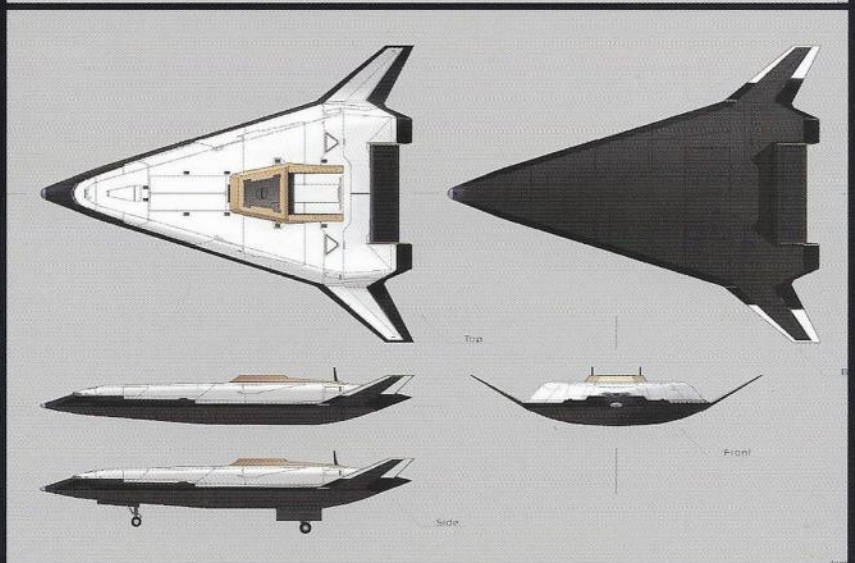
Arsenal Birds

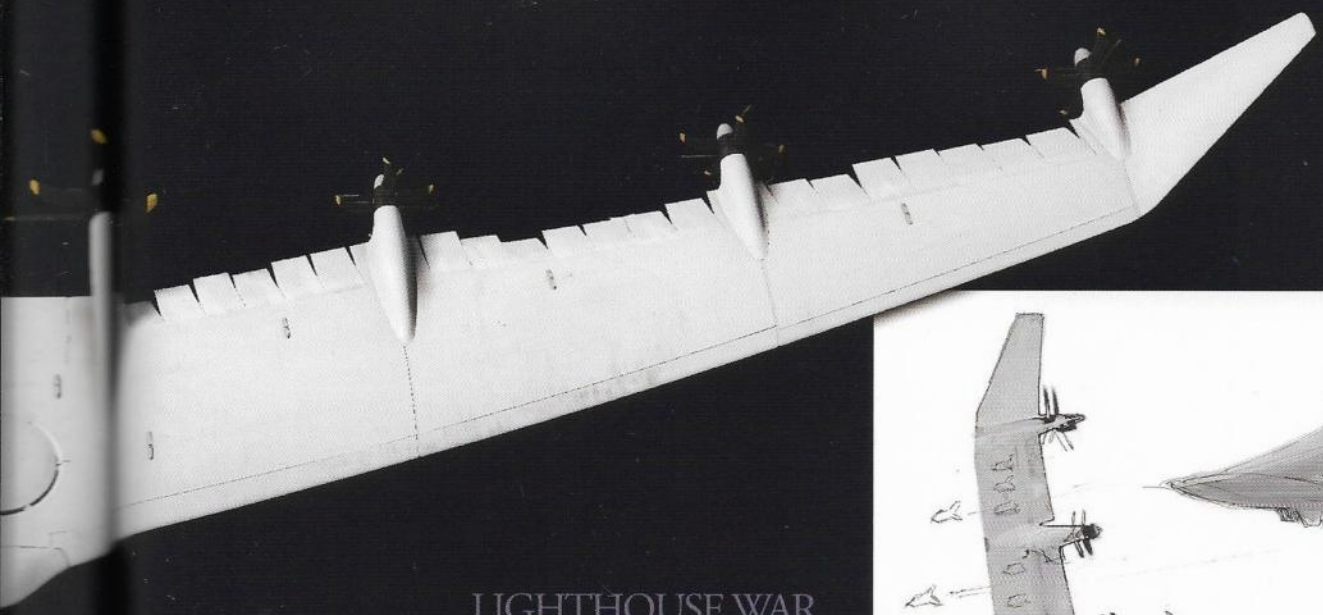
A gargantuan, 1,100-meter wingspan unmanned aerial vehicle carrier (UAVC) developed by Osea to defend the space elevator.
While it can receive commands from control systems on the ground or in the air, it is not remotely piloted, relying instead on an autonomous AI. It operates in a 1,200 kilometer radius centered on the space elevator.
Two Arsenal Birds, Liberty and Justice, continually patrol the area, seeking out and eliminating hostile forces.
The undersides of the main wings are filled with compartments for carrying UAVs and medium-to-long-range missiles.
In addition to stored weaponry, the fuselage is equipped with tactical laser systems (TLS), pulsed laser cannons, SAMs, and other defenses.
The dorsal rectenna dome receives energy to power the aircraft through microwave transmissions from the solar generation satellite atop the space elevator.
Its driving force is generated by enormous motors that power contra-rotating propellers.
Rearmament and maintenance is regularly performed by supply ships launched from the mass driver base on Tyler Island.
This allows the Arsenal Birds to maintain constant flight at high altitudes.
To defend against incoming missiles and other projectiles, the rectenna is capable of instantaneously emitting stored energy into a shield of electricity that deflects and destroys.

Supply Ships

These aircraft fly out from the Tyler Island mass driver base to support the Arsenal Birds.
Most of the space in the piggybacked docking module is taken up by ammunition and fuel for defensive weaponry and MQ-101 unmanned combat aerial vehicles (UCAV). After docking with an Arsenal Bird, supplies are automatically sent through internal mechanisms to UCAVs suspended under the craft.
Propulsion for the Arsenal Bird itself is provided by solar power, so it does not require refueling.
The mass driver's electromagnetic catapult fires while the linear aerospike engine propels the craft, which allows it to carry considerable weight at high speed.

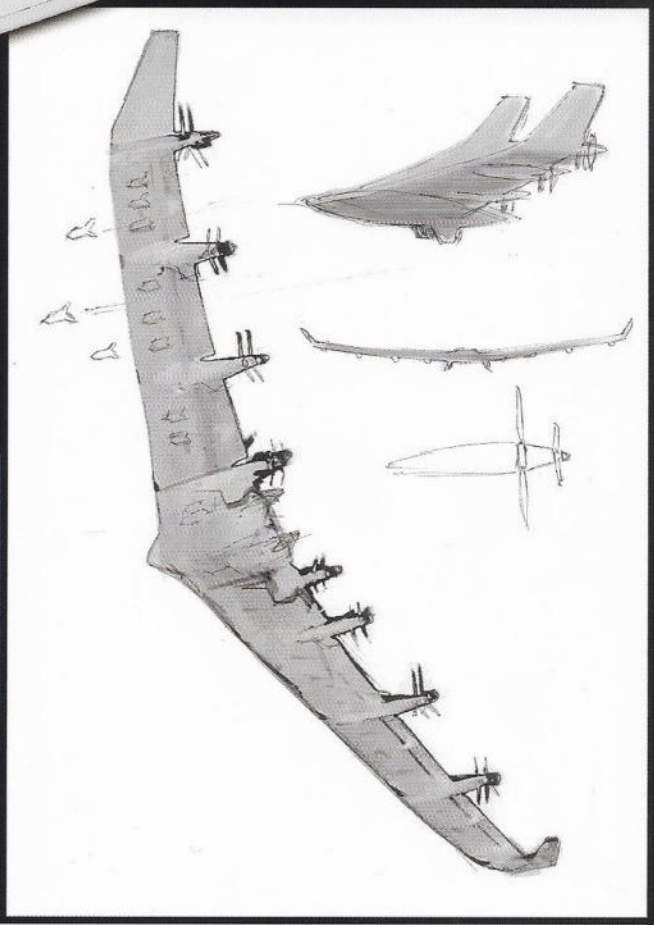


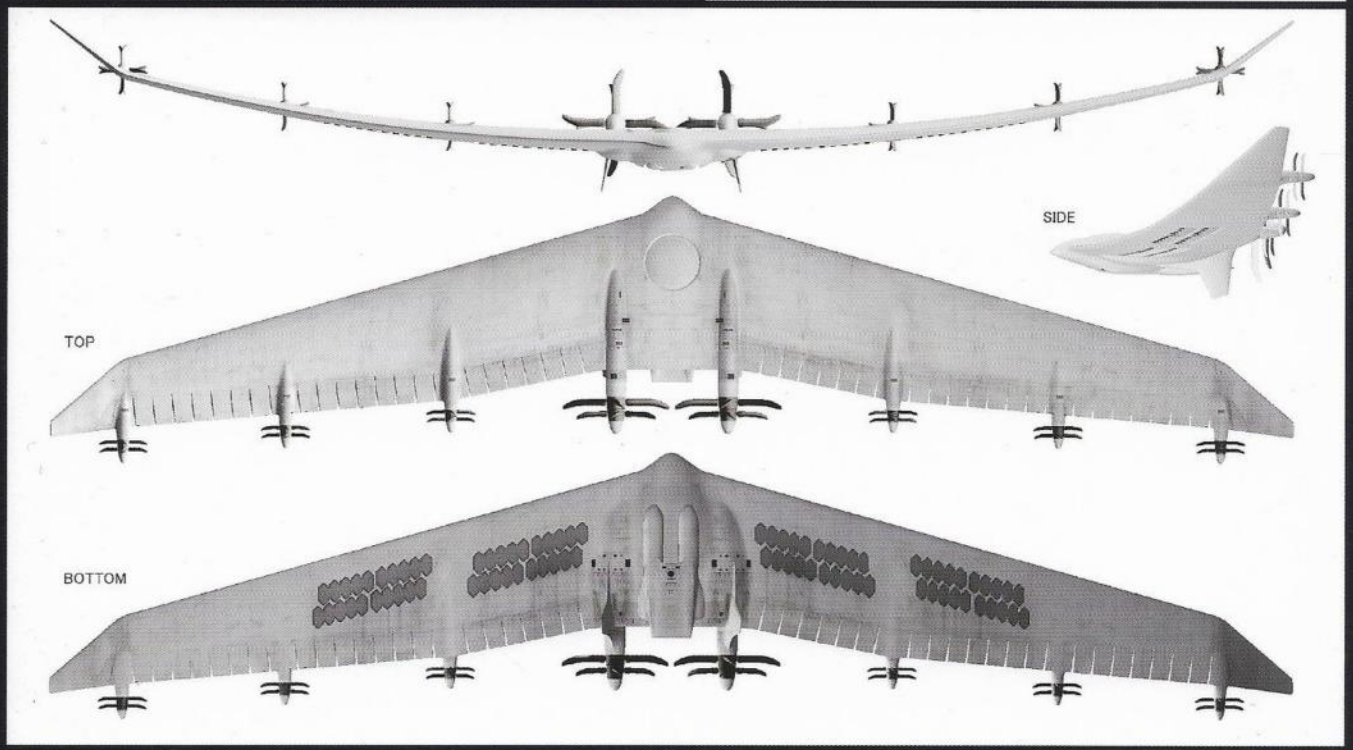




LIGHTHOUSE WAR

05.2019 – 12.2019





Mass driver launching a supply ship

The mass driver is a massive catapult launch system that uses electromagnetic energy to propel spacecraft into orbit. It was built on the northern portion of Tyler Island located south of the Usean continent. The air base where the IUN peacekeeping forces are stationed was expanded to accommodate the 12-km-long system. The Arsenal Birds, a defense system for the International Space Elevator (ISEV), were developed here at this base, and then launched with the mass driver. Thereafter, the launch system was used to periodically send supply ships to the Arsenal Birds, making it a key component of the ISEV defense structure.

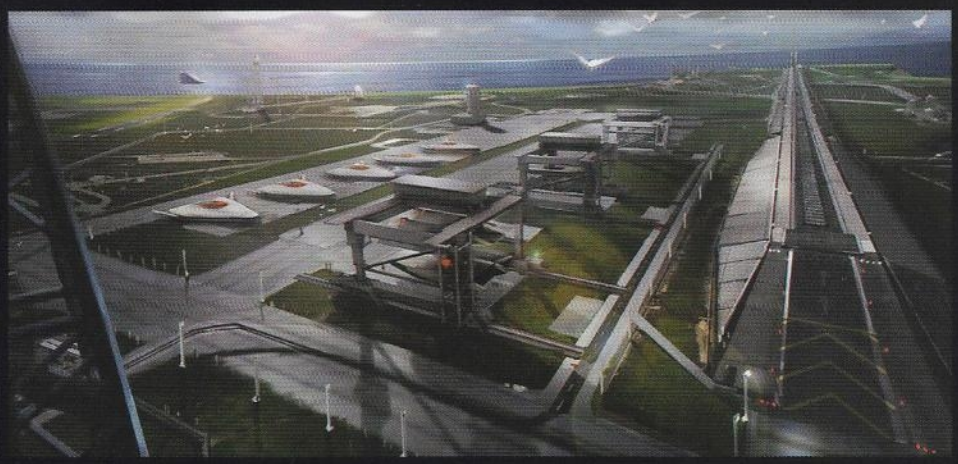
Mass driver

This image shows the launch of a fully loaded supply ship. Manned ships are accelerated to Mach 2 by the launch catapult and then a linear spike engine is used to maintain launch velocity.

Unmanned ships can be propelled to even greater speeds because there is no need to worry about the effects of excessive g-forces on the human body.

After it is launched, the supply ship rendezvouses with one of the Arsenal Birds patrolling the space elevator and docks after matching its relative speed. It then supplies the Arsenal Bird with engine lubricant and replaces weapons via the docking module, and refuels the onboard combat drones and reloads their weapons.

LIGHTHOUSE WAR 05.2019 – 12.2019



Apron with a number of supply ships parked. The mass driver on Tyler Island differs from the similar facility built at the Basset Space Center in Osca in that it is not meant to ferry supplies anywhere except to the Arsenal Birds. Its main mission is to keep the Arsenal Birds in working order, and to that end, it uses a rotating fleet of supply ships.

Measures have been taken to enable the reuse of the docking modules, which were originally designed to be disposable. Two supply ships are normally launched at the same time: one to receive the empty module from the Arsenal Bird and another to deliver a supply-laden module to it.

The supply ship brings the empty module back to base, where it is reloaded with supplies using a gantry crane. After the ship is refueled, it is launched again to continue the cycle.

Tyler Island was originally an aerospace base operated by a space development federation comprised of Usean nations and had a launch pad for chemically fueled rockets. With the construction of the space elevator, the base's rockets and ships were gradually phased out, and now they stand as a monument to the advances made in space technology and science.

Mass Driver Launch of Arsenal Bird No. 1

A brilliant flame lights the predawn sky. Justice, the first Arsenal Bird, is launched from the mass driver base on Tyler Island. The massive aircraft weighs 100,000 tons when empty, making it impossible to launch with an electromagnetic catapult alone, so solid-fuel boosters give it extra propulsion.

It will undergo three months of testing, from the countless unmanned combat aerial vehicles under its wings to docking verification with rearming and supply ships, before the second Arsenal Bird, dubbed Liberty, joins it in its 1,200 kilometer-radius patrol zone. The rectenna dome in the center of the craft receives microwave energy, allowing it to remain mobile even at night.

The Arsenal Birds were built to protect the space elevator connecting us to the heavens. The two great birds will maintain constant vigilance as a symbol of peace and economic equality on the continent of Usea.

PROFESSOR >—< ART DIRECTOR **DIALOGUE 01**

A Real Space Elevator

The space elevator and the Arsenal Bird, which were two of the main pillars of Ace Combat 7's story, were both designed by the game's art director, Masato Kanno. He visited Dr. Yoshio Aoki, a world-renowned expert on the topic of space elevators and a professor of science and engineering at Nihon University, in order to learn about the reality behind the space elevator concept.

How would a space elevator be built?

Kanno: When I first thought about putting a space elevator in the game, I went to speak with Dr. Yoji Ishikawa at the Obayashi Corporation, who leads their space elevator research team. Once there, I received a book for reference that contained a rather scenic picture of a possible Earth Port for a space elevator. I found it to be very inspiring. The design of the «ISEV» space elevator in this game was strongly influenced by that picture. Previously, my image of a space elevator was simply that of a climber device ascending up toward outer space along a long black cable floating in the air.

Aoki: It was actually implied in the picture, but where did you imagine this Earth Port was located?

Kanno: It reminded me of a tropical island.

Aoki: In other words, it was close to the equator. It is the same when launching rockets, but the best place to build a space elevator would be somewhere near the equator. Although it is not explained as such, the picture in the book clearly considers that fact.

Kanno: You're right. The book didn't mention anything about a tropical island directly. So, if it should be near the equator, then I imagine it doesn't need to be in a large population center. Is that correct?

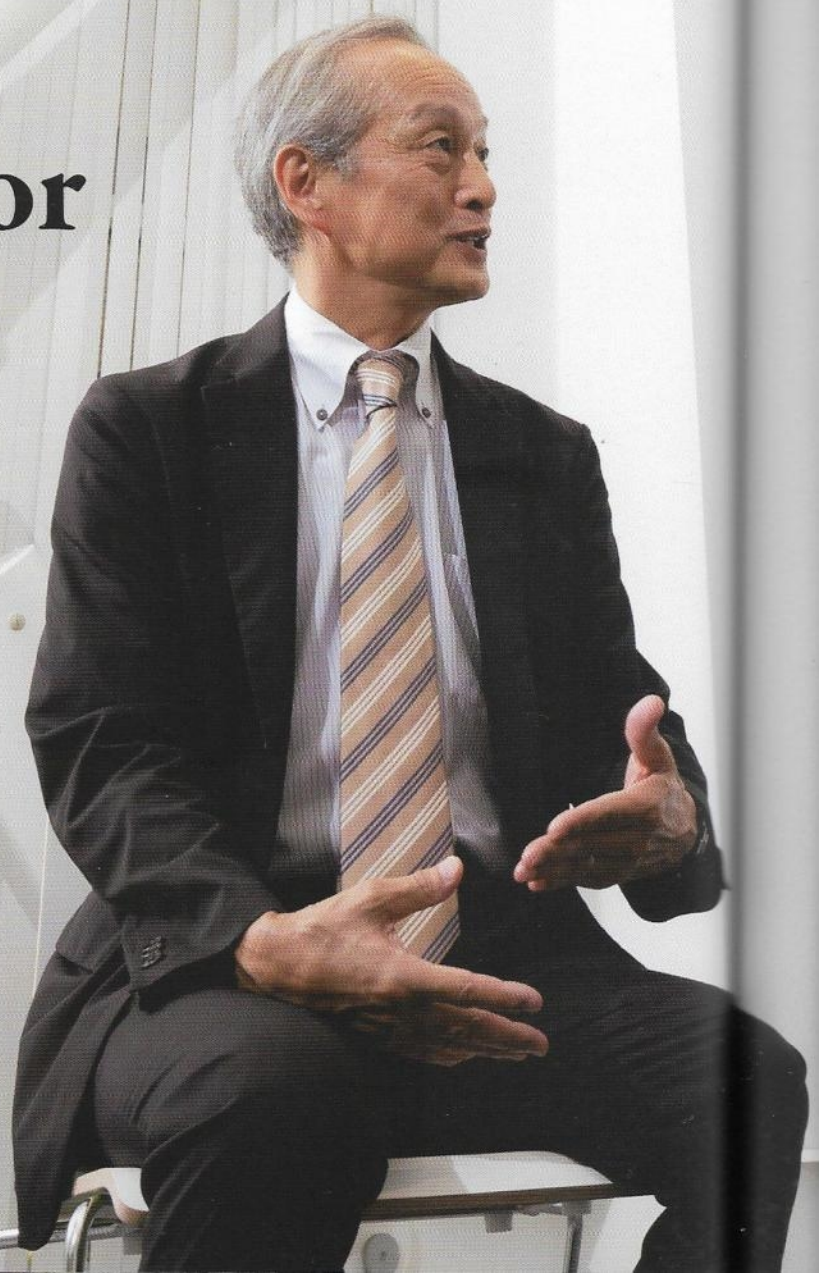
Aoki: Naturally it would be difficult to build something like this near a country's major city. From the early stages of developing my space elevator concept, I said that it was not the type of project that could be built by any one country or corporation. By building it in such a way, it would definitely be a target for terrorists given that it'd be the only one of its kind. Therefore, it is likely that an organization such as the United Nations would need to take the initiative and build it at sea in order to help ensure its safety. Furthermore, the list of possible locations is narrowed even further if you look for an area with a stable climate. There are multiple candidate sites to the west that are ideal due to being located not too far from land and also considering the prevailing winds. This list includes places such as the Galapagos Islands in the Pacific Ocean, the Maldives in the Indian Ocean, and other locations throughout the Atlantic and Indian Oceans.

Kanno: The location of the space elevator in Ace Combat 7 is a place where there are a lot of ships coming and going, and supplies are concentrated in a large container yard, making them easy to send into space. In the real world, I suppose it'd be a place like Singapore. Are you saying it would be dangerous to build a space elevator in such a location?

Aoki: No, I don't mean to infer that you couldn't build it near a major population center. For example, an IAC (International Astronautical Congress) committee examining the development of a space elevator believes a good location would be off the shore of Brunei, which is actually quite close to Singapore in Southeast Asia.

Kanno: We imagined that the space elevator would be constructed at sea in relatively shallow waters. Although, if you want to take advantage of the space elevator's merits, would it be better for the elevator cable and the Earth Port to be able to move without being attached to the ground?

Aoki: I think it's better if the system is not affixed to the ground. There are variousphysical forces acting on and around the Earth's surface. I think chief among those has got to be the gravitational force exerted by the moon.



We are talking about a force capable of controlling the tides, so it would obviously have an effect on a cable with a length of up to 1/4 of the distance to the moon. Based on various calculations, that force would tighten and loosen its grip on the cable in nine to twelve hour cycles. Therefore, although the cable would be relatively loose, it would be affected by vibrations. If the cable were attached to the ground, it would naturally place stress on the base supporting it, which could lead to the destruction of its foundation. However, if that base were floating in the ocean, there are several techniques that you could use to control those forces. In particular, the Obayashi Corporation has developed a submarine-like system that can float an oil rig by using ballast tanks that adjust the amount of water they contain according to the tides. It is referred to as an «antiphase,» and when the vibrations pull on the cable, it takes in seawater to help the base withstand the forces, and when the cable loosens, it expels the water to help it float. Basically, it can be relaxed or suppressed by providing a force in the opposite direction of the cycle.

Kanno: I see. In that case, it would not be necessary to firmly affix the cable to the Earth Port and would avoid any problems as long as there was a system in place to offset the stress exerted vertically along the cable. As such, I guess the design of our ISEV that extends and contracts a cable from an ocean-based facility is not that far from reality.

Aoki: That's exactly right. It would have a little trouble with sideways movement, but it'd be fine to move up and down. Additionally, the ISEV design that surrounds the cable with shielding makes sense as well. There is a climber competition known as SPEC held each year that is backed by the Japan Space Elevator Association, but perhaps the biggest challenge faced every time is wind. Even slight winds can give rise to vibrations that lead to tremors affecting objects gripping the cable.

Kanno: I also remember seeing footage of the climber competition where the cable was being blown by the wind and affecting the position of the climbers. That led me to think that if problems were to arise, they'd likely be a result of wind. That is how I came up with the idea of a shield to help suppress the winds affecting the cable. However, we're talking about a 12km tall structure here; is it even possible to build such a thing?

Aoki: It depends on what you use to make it. Currently, buildings are designed and built with various sturdy materials to ensure that they do not collapse under their own weight or that of various heavy objects, right? Therefore, if the structure in this case is only affected by the wind, it can use a soft and lightweight material much like a balloon. In addition to rubber, you could also use something like aluminum or a polymer film. The Tokyo Dome is a building with an air-supported roof that inflates using pressurized air.

Kanno: You mean like an inflatable module. I see... I never really thought about using such a flexible and lightweight material.

I think those behind its conception will need to ensure that measures are in place to deal with any potential problems.

Space Elevators and the Environment

Kanno: In the game's story, the space elevator becomes the center of conflict between countries. Conversely, there is also an element where the space elevator serves as a beacon that brings people together. If this ever becomes a reality, how do you think the world will react to a space elevator?

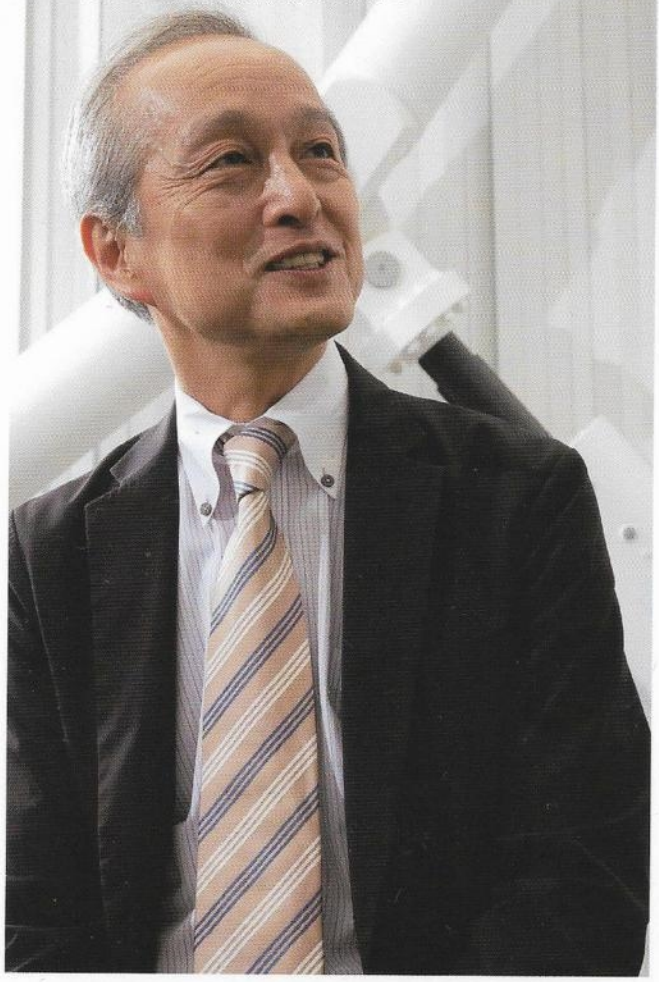
Aoki: That is a very difficult topic. Actually, when I first saw the Ace Combat 7 trailer (released on August 21, 2018), one line in particular struck a chord with me. I feel the words «the skies will never become one» at the end of the trailer are extremely important. There is little doubt that a space elevator would be exposed to the threats posed by war and acts of terrorism. We will really need to think about whether we are doing the right thing in building a space elevator and if it will actually help make the world a better place. I think those behind its conception will need to ensure that measures are in place to deal with any potential problems. On a scale of one to a hundred, with one hundred being a complete, fully functioning space elevator, I'd say we're only at about a one right now. And I'm not even sure that's the best answer to the question.

Kanno: I feel that the phrase «will never become one» is a very mature way of looking at the issue. Mankind consists of various ethnic groups, territories, and religions, and there are vast differences between them, such as what they eat and their levels of science and technology. It simply isn't possible for them to become one single entity.

Yoshio Aoki

Professor & Doctor of Engineering, Nihon University College of Science and Engineering
Born: January 19, 1957

At Nihon University, he mainly teaches the subjects of structural mechanics and safety design engineering. Space elevators are one of his major research fields, and he has been a driving force in taking the space elevator concept and turning it into reality. He has authored numerous works, including "Modeling and Optimization Technology for Architectural, Urban, and Environmental Design," "Object-Oriented Numerical Methods in JAVA," and "The Birth of the International Rescue Team -The Story of the Birth of the N.RESCUE International Rescue Team-".



I think it is very important for people to unite around large-scale endeavors, but I also sense the danger that such single-minded optimism can bring by pushing something forward that might not actually be such a great idea after all.

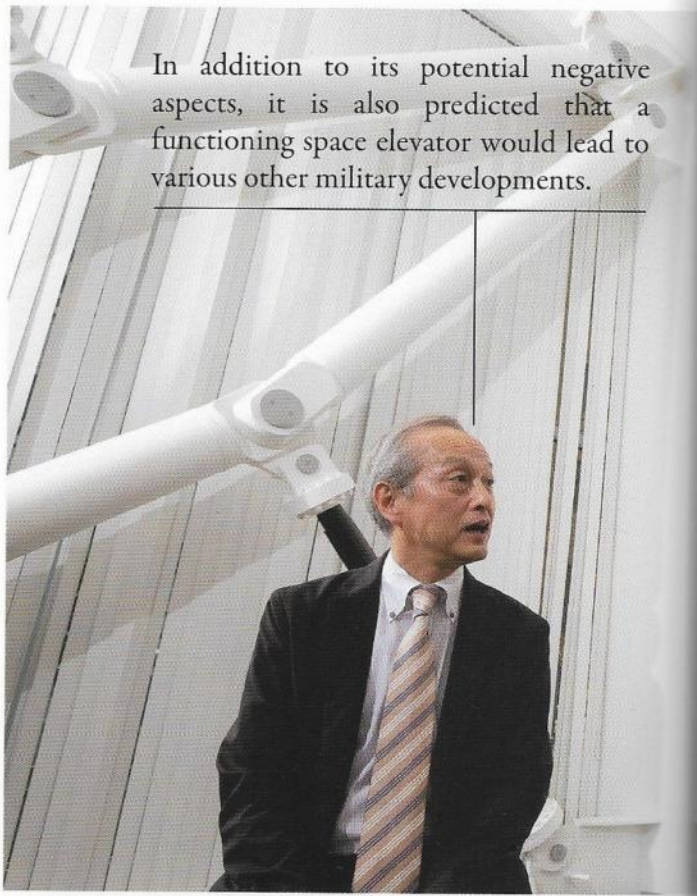
Aoki: You could say that's always been a source of both good and bad when it comes to scientists. Despite its obvious problems, the atomic bomb was developed out of a desire to do good. In addition to its potential negative aspects, it is also predicted that a functioning space elevator would lead to various other military developments. I think that by considering these factors in the context of the Ace Combat 7 story, today's young people may approach efforts to create a space elevator with the seriousness the project demands.

Kanno: You mean that those involved in science and technology must have the ability to properly imagine the future, and not just believe that everyone will be happy with new technologies that are developed. We touched upon the space elevator's negative aspects, but it is currently being considered to solve real problems that actually exist today. While it is tremendously exciting to watch a rocket explosively blast off and rise up into the sky, what are the advantages of human beings using a space elevator to travel to space?

Aoki: First of all, it will enable the transport of large quantities of goods and supplies. I often mention the amounts in my presentations, but rockets are currently limited to devoting about 5%, or maybe up to 8%, of their total launch weight to their payload. I think 10% would be pushing it. The large quantity of fuel required and the booster engines make up most of the weight. On the other hand, the space elevator that won the overall prize in the European Space Elevator Challenge 2018 held this past September successfully lifted a payload of 8.7kg compared to its weight of 6.3kg, thereby exceeding a payload to weight ratio of 100%. On September 23, 2018, JAXA's H2B rocket launched with a payload of three small satellites. (The payload also contained satellite parts and supplies for the International Space Station.) A 6.3kg space elevator could take at least eight of those into orbit. Just imagine the ability to launch more than twice the number of such small satellites into space.

Kanno: It's no contest when it comes to efficiency.

Aoki: Furthermore, a space elevator is essentially electric-powered, so there is no need to consume fuel. You may have tradeoffs in terms of speed, but our ultimate goal is to have the space elevator powered entirely by solar energy. That will help reduce the amount of solid fuel and electricity needed.



In addition to its potential negative aspects, it is also predicted that a functioning space elevator would lead to various other military developments.

Furthermore, electricity will be generated when the elevator is descending, so if it is able to use that electricity for its ascent as well, the system will be emission-free. This is all theoretical, of course, but it still remains within the realm of possibility.

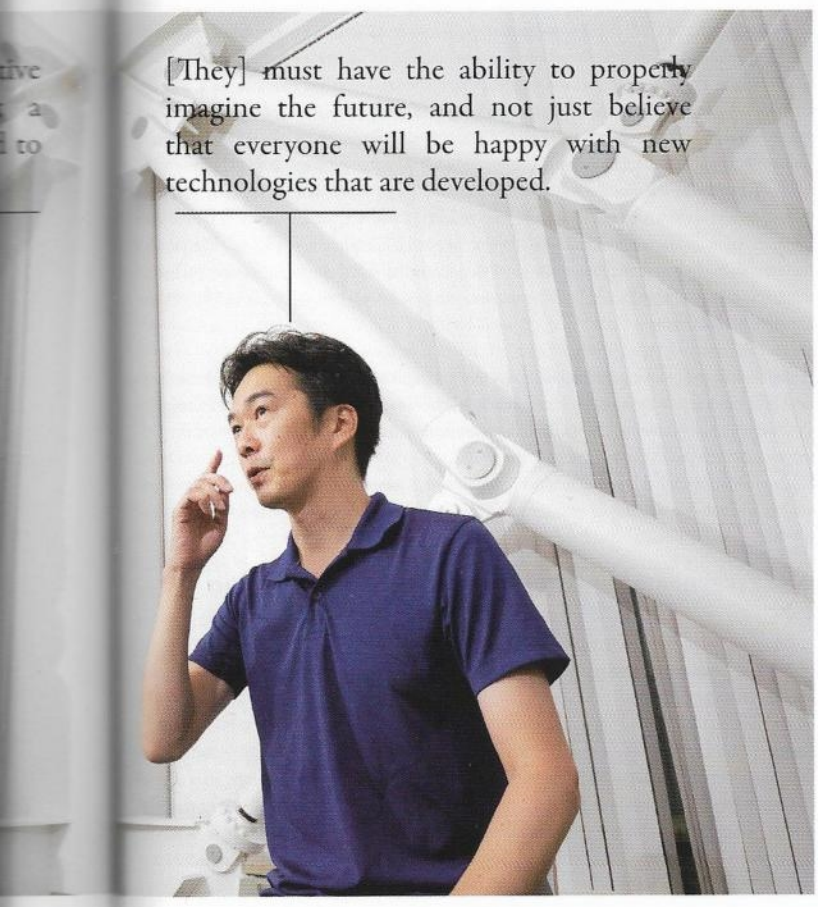
Kanno: If we can achieve that, there will be no need to launch chemically powered rockets anymore. I imagine it will force the entire industry to change, and the people involved in rocket development and fuel production are probably going to have to start researching new areas as well. In addition, if we can create a space-based solar power generation mechanism that generates electricity from the sun's rays without them being blocked by the atmosphere, we can then transmit that energy to the Earth in the form of microwaves. I think that would also bring about massive changes in our current energy infrastructure.

Aoki: I think the biggest changes would occur in countries that rely on petroleum imports and therefore have economies that are highly sensitive to the balance of supply and demand in the sector. There is no doubt that energy self-sufficiency can lead to much greater freedom for a country. In regards to that particular problem, I believe there are many merits to space-based solar power generation for Japan as well.

Kanno: Over the course of developing the game, I wanted to make a story that was somewhat grounded in reality. As such, the one thing I couldn't avoid was the question of what kind of energy these people were using to power the things around them. In the game, I hope players realize that the solar power generation satellite at the top of the space elevator is the key to the overall story.

Aoki: There is also the concept of placing space elevators in the Pacific, Atlantic, and Indian Oceans, and then connecting them in outer space via an «orbital ring.» Due to the sheer amount of solar power generated, I think it would be possible to charge an aircraft during flight through the use of wireless power transmission. Is the Arsenal Bird also propelled by a motor?

Kanno: Yes. It is positioned as a large-scale defense system for the space elevator. I imagined it being powered by electricity generated from space-based solar power generators transmitted to the earth in the form of microwaves. Its overall shape was inspired by the Helios solar-powered aircraft developed by NASA. I knew from the moment I saw it that it would be a very energy-efficient form factor and figured that I could adapt it for use in the game. It would not need time to replenish its energy source, and it would avoid accidents caused by the use of chemical fuels. When designing it, I basically considered it to be a kind of ultimate airplane for the game.



[They] must have the ability to properly imagine the future, and not just believe that everyone will be happy with new technologies that are developed.

Aoki: There are many other possibilities besides simply converting light into electricity. For example, the sun also emits plasma (charged particles), and simply stretching a cable through space will absorb those particles and cause an electric current to flow along the cable. That is the aim of things such as tethered satellites and tether propulsion. If you extend a cable in order to take in electricity and use it to power spacecraft, it would completely change our concept of the need for fuel, at least for travel within our own solar system. Do you know the difference in thrust produced by the Hayabusa 2's ion thrusters versus what is required for a rocket to escape our atmosphere and journey into space?

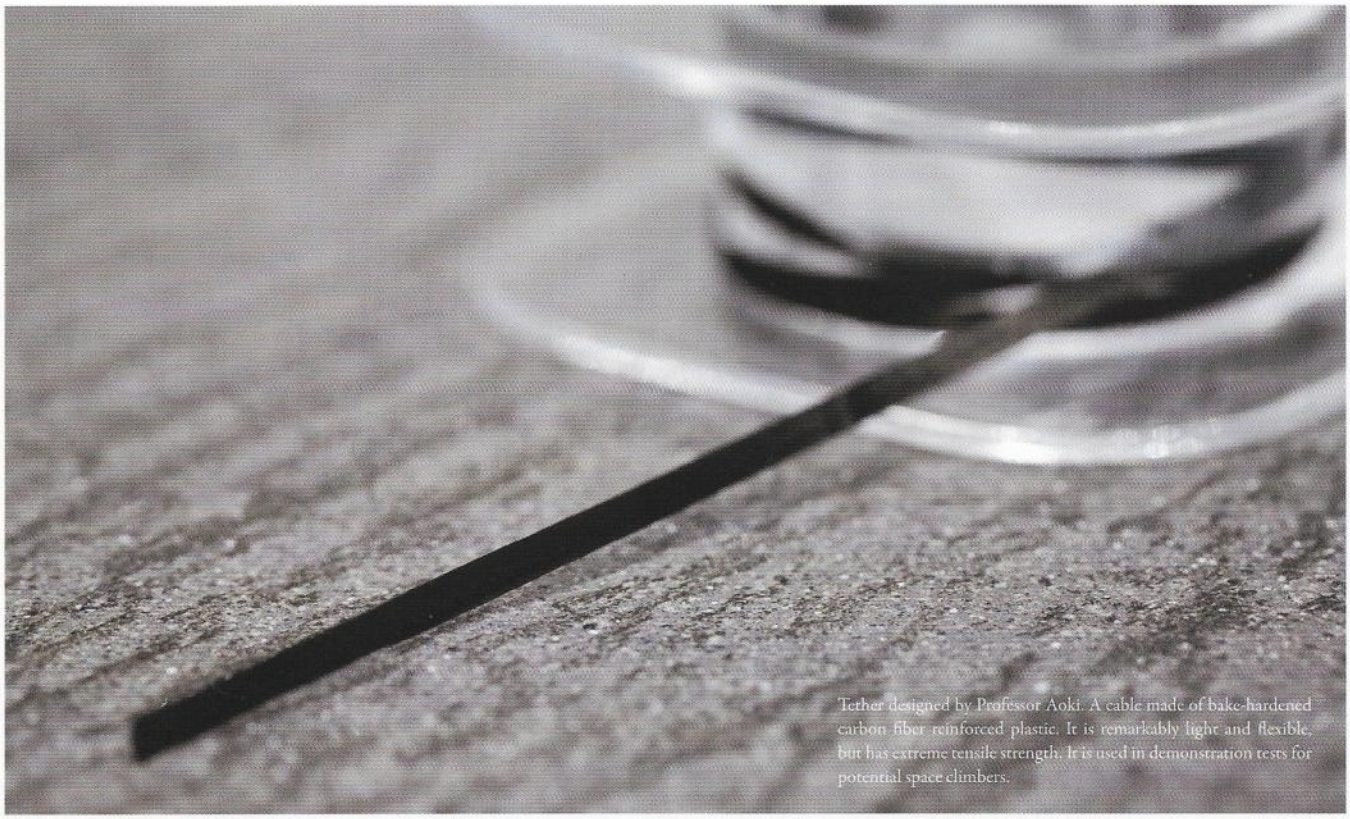
Kanno: Ion thrusters are engines that use positive ions to generate thrust, right? I have absolutely no idea.

Aoki: The thrust generated by ion engines is on the order of one millionth the amount. So, you see, even small amounts of thrust can be used for space travel. A rocket needs a million times more thrust to escape the thin atmospheric region and reach outer space, which is probably only a distance of 100km at most. However, once in outer space, you can use just a little bit of power to travel through space almost indefinitely. I feel the most difficult part of space travel is actually escaping the atmosphere that serves to protect us. It becomes much easier once you reach outer space, with its lack of climate variations, so I've been thinking that maybe the hurdle posed by the space elevator is actually quite low.

Masato Kanno

Art Director, Bandai Namco Studios
Born: April 9, 1971

A long-time veteran of the Ace Combat franchise, he has been involved in its development since the very first title. He has contributed greatly to the series' visual aspects, including the design of the original weaponry found in many of the titles. He has taken a lead development role on Ace Combat 7 as its art director.



Tether designed by Professor Aoki. A cable made of bake-hardened carbon fiber reinforced plastic. It is remarkably light and flexible, but has extreme tensile strength. It is used in demonstration tests for potential space climbers.

Engineering and Art Design

Kanno: Clearly, a space elevator would become something of a landmark due to its sheer size. When you look at landmarks in Japan, there is the Tokyo Tower and Tokyo Skytree, while France has the Eiffel Tower. I feel that these structures that become landmarks have a large influence on the culture of the area and the way its people think. They have been known to affect the feelings of the people around them, and the resulting influence on their design cannot be ignored. On the other hand, I imagine there must be an optimal design when it comes to the actual composition of such structures. What kind of things do researchers demand in a design?

Aoki: There is a book called «The Power of Limits: Proportional Harmonies in Nature, Art, and Architecture» written by Gyorgy Doczi and translated into Japanese by Koji Taki. In it, the author examined numerous things considered beautiful in the world, focusing on the golden ratio. It states that structures considered beautiful, whether they be plant, animal, or manmade structures, tend to follow a fixed ratio. Additionally, there is also the concept of «functional beauty.» Take fighter aircraft and airplanes in general, which are the theme of this game; they're made to fly, so their visual aesthetics don't really factor much into their design, do they? In the book, it mentions Boeing and the Concorde as examples of creations that were built in order to fly and afterwards people started labeling as beautiful. That points to it being something of an acquired perspective. I thought it was an important topic for people who build things. There's definitely something to that line of thought, given that they focused on functionality over visual beauty, but something that people perceived as beautiful still remained in the finished design.

Kanno: I suppose when someone understands the function of a structure or sees it realize its potential, it changes the viewer's standard of value.

Aoki: It may be so for the tools and buildings around us as well, but you often have structures or landmarks that follow such a process and are noted for having their own sense of style. In that regard, I suppose functional beauty is yet another kind of beauty that must be taken into account. Buildings often look like large clumps of steel during the day, but may seem beautiful when seen at night, so that is definitely a point to consider.

Kanno: So a design may not necessarily be considered beautiful in its beginning stages.

Aoki: And in the end, they eventually meet with the same fate. Mathematics is often used to explain things in nature, whether it be the branches of a tree, the distribution of a flower's seeds, or the number of its petals, and they usually seem to fall within a certain range, although that may just be because the mathematicians decided to make it that way.

Kanno: Thinking the shape of a feather to be a beautiful thing, I wanted to give an impression of elegance with the Arsenal Bird's movement. I made its numerous flaps move organically like the wings of a bird soaring through the sky, rather than some clunky enemy aircraft. I have a theory that when human beings look at organic objects, they have the perception that they are somehow more «trustworthy.» For the design of the ISEV, I reversed the shape of the earth's latitude and longitude lines, which made for a design that looks something like an inverted black hole. I wanted to invoke a comprehensive image of a loosely R-shaped object being sucked into something. Also, I thought that I should incorporate the concept of using objects as a mirror into ourselves (that either interpretation is possible), which is the theme of the game. I incorporated the laws of nature into the ISEV's art design, such as showing its reflection in the ocean surface or the moment when droplets hit the water and cause ripples to emanate outwards, in the hopes of creating something that people feel like they can trust. I think that good design comes from the harmonious fusion of functionality and things that exist in nature, rather than focusing solely on one at the expense of the other.

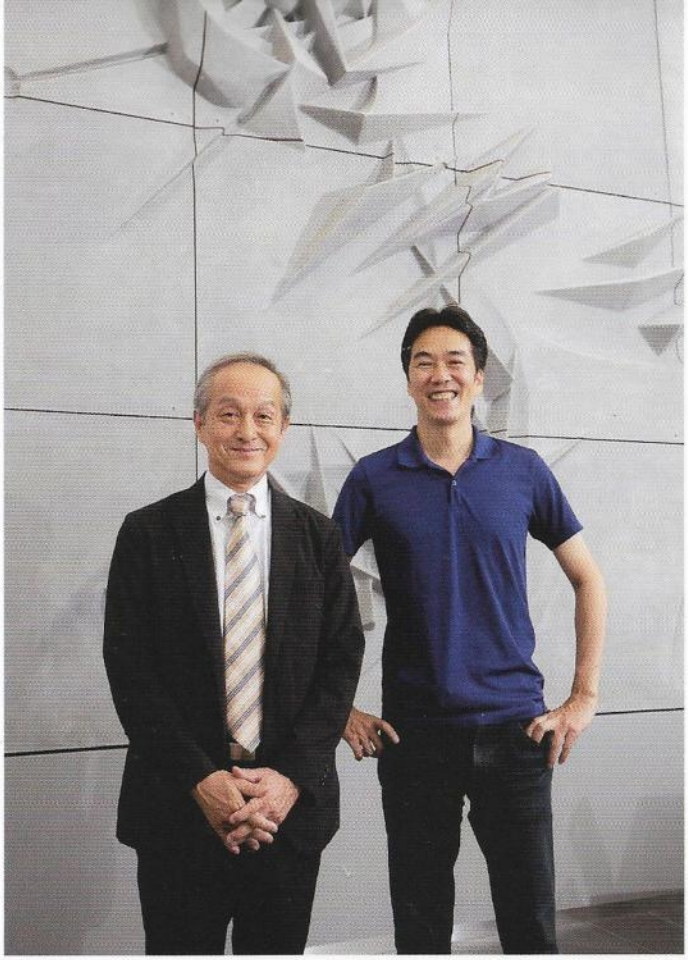
Aoki: Since many young people will play the game, it would be interesting to see them hear the term space elevator in the future and then draw the one featured in the game after remembering seeing the design for one somewhere.

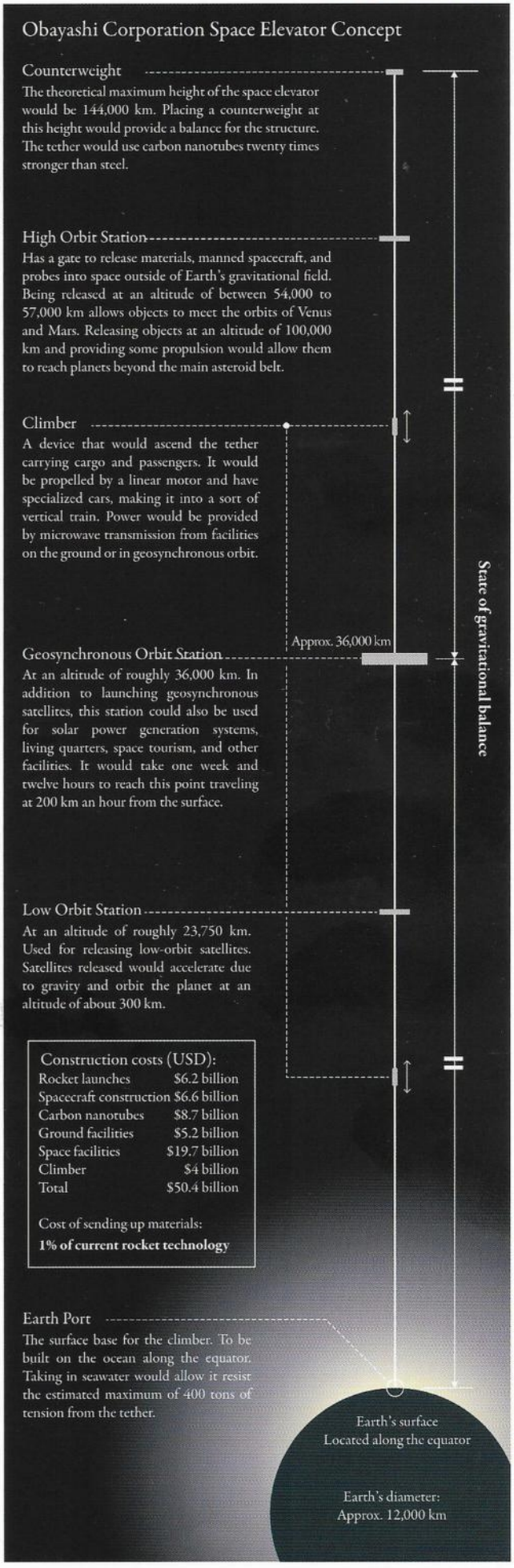
Kanno: As a designer, I couldn't ask for anything more than people thinking of my space elevator as an example of an elegant design when considering the topic.

The Present and Future of the Younger Generation

Kanno: How does the younger generation you're currently teaching view the concept of the space elevator? Are they thinking to carry on your ideas, or are they trying to surpass them?

Aoki: I think there are two different aspects at play. The digital generation has mastered the use of the various tools at their disposal, so there is no doubt that a kind of rationality occasionally appears in their way of thinking. However, I believe that the difference between when it comes out and when it doesn't is rather intense. I advise them that if it is difficult to make a prediction for the future, they have no choice but to look to the past.



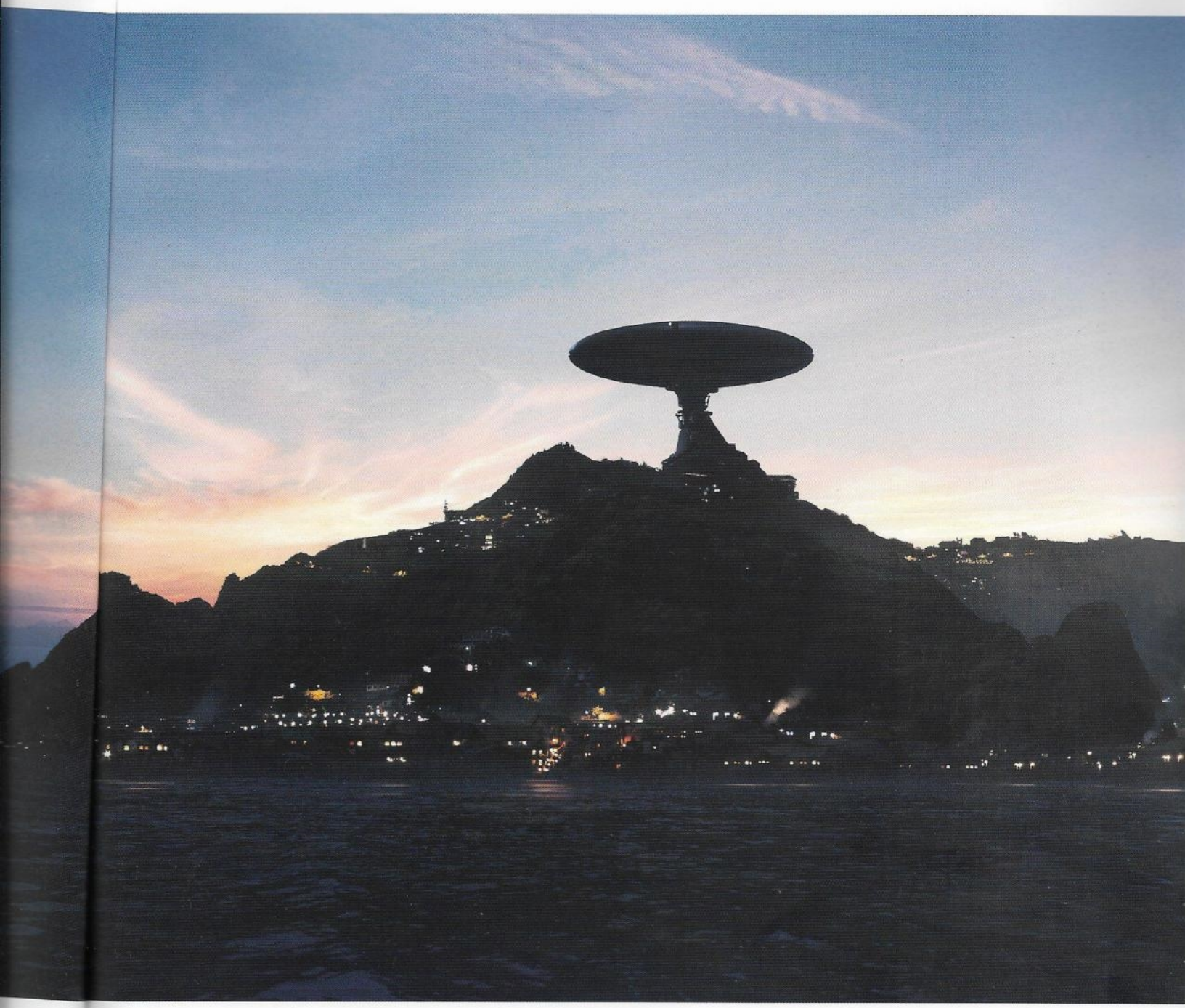

Obayashi Corporation Space Elevator Concept
Counterweight
The theoretical maximum height of the space elevator would be 144,000 km. Placing a counterweight at this height would provide a balance for the structure. The tether would use carbon nanotubes twenty times stronger than steel.
High Orbit Station
Has a gate to release materials, manned spacecraft, and probes into space outside of Earth's gravitational field. Being released at an altitude of between 54,000 to 57,000 km allows objects to meet the orbits of Venus and Mars. Releasing objects at an altitude of 100,000 km and providing some propulsion would allow them to reach planets beyond the main asteroid belt.
Climber
A device that would ascend the tether carrying cargo and passengers. It would be propelled by a linear motor and have specialized cars, making it into a sort of vertical train. Power would be provided by microwave transmission from facilities on the ground or in geosynchronous orbit.
Approx. 36,000 km
State of gravitational balance
Geosynchronous Orbit Station
At an altitude of roughly 36,000 km. In addition to launching geosynchronous satellites, this station could also be used for solar power generation systems, living quarters, space tourism, and other facilities. It would take one week and twelve hours to reach this point traveling at 200 km an hour from the surface.
Low Orbit Station
At an altitude of roughly 23,750 km. Used for releasing low-orbit satellites. Satellites released would accelerate due to gravity and orbit the planet at an altitude of about 300 km.
Construction costs (USD):
Rocket launches $6.2 billion
Spacecraft construction $6.6 billion
Carbon nanotubes $8.7 billion
Ground facilities $5.2 billion
Space facilities $19.7 billion
Climber $4 billion
Total $50.4 billion
Cost of sending up materials:
1% of current rocket technology
Earth Port
The surface base for the climber. To be built on the ocean along the equator. Taking in seawater would allow it resist the estimated maximum of 400 tons of tension from the tether.
Earth's surface
Located along the equator
Earth's diameter:
Approx. 12,000 km

If you know the points from a certain period of time and plot them on a graph, you can see where they're heading in the future. Amongst this younger generation, there are sometimes those who «look to the past» with great interest. Those are the ones who are often the most capable.

Kanno: If I were younger, I'd be very interested in the topic of space elevators. It's because I'd know about the carbon nanotube technology developed by Japan in the 1990s and also because I believe that new possibilities will arise as the materials are refined and improved over the years. That being said, does the younger generation understand the difficulties and technical challenges that lie in front of them?

Aoki: Clearly, the thought of exploring this previously uncharted territory appeals to them significantly. That's the driving force behind the Nihon University College of Science and Technology's entire way of thinking. More than 50 years ago, when research papers in the West stated that extended human-powered flight was an impossibility, Professor Kimura (Hidemasa Kimura, an aircraft designer who developed the YS-11 among other craft) and the students of the College of Science and Technology took up the challenge and were the first group in Japan (second in the world) to successfully perform a human-powered flight. The Funabashi campus features a large amount of land, so you can fly airplanes, drive cars, and use other large devices with plenty of room for experimentation and failure. I do not have very many students who are reluctant to do things that may lead to failure. At first, space elevators were only the stuff of science fiction, and even the chairman of the Space Elevator Association told me that people would probably think it was crazy for a university researcher to study space elevators (laughter). Of course, the students themselves are fascinated by the topic. I continually tell them things such as ways they can control the key technologies or that they should analyze their failures in order to learn from them. I feel they achieve a greater sense of accomplishment and satisfaction if they come up with the solutions by themselves. They learn from their mistakes and grow from them without me even saying a thing. Therefore, I feel more like I'm helping them to grow naturally rather than teaching them something specific.

Kanno: It is because you take that stance that they're able to have such an opportunity. It is often said that it is hard to start new things or face difficult challenges as you get older, but after speaking with you today, I feel there is still much that my generation can accomplish.



A World of Expanding Solar Power

Sunset near the Daonan Islands southwest of the Gunther Peninsula. The immense antenna on the island is pointed at the solar power generation station atop the space elevator.

Problems with electricity on the island were compounded when the impact of the asteroid shifted the sea currents and broke the undersea cables tying it to the mainland. This made it a top priority in Usea's plan to use the ISEV in reconstruction. Changing to microwave power transmission will free the island from natural sources that suffer from frequency fluctuations and instability.

Twenty years after Ulysses struck, real recovery can finally begin.

Crater Lake in Chopinburg Rainforest

The force of the Ulysses Impact Event here was horrific. The fragment that struck the rainforest carved a massive crater in the ground and even changed the course of nearby rivers.
Even after 20 years of being weathered and worn down by copious amounts of rain, the crater's size is still unprecedented.
Development of the river basin has gradually advanced, supplying lumber from the forest's trees to neighboring countries that are experiencing economic growth.

LIGHTHOUSE WAR 05.2019 – 12.2019

The Ghost of Stonehenge

Stonehenge, a massive asteroid intercept facility in the desert south of San Salvacion, was seized by the former Federal Republic of Erusea during the Continental War, only to be destroyed by the ISAF Air Force, save for one of its railguns.

Railgun four on the southeast side of the site had already sustained a direct hit during the 1999 Ulysses Impact Event after the superweapon failed to intercept all the incoming asteroid fragments.

The railgun along with the nearby shield wall were damaged, and while the gun escaped utter destruction, it was rendered inoperable. The former Erusean military tried to repair it, but eventually gave up. They continued to use the remaining seven railguns until they were destroyed, then abandoned the site.

Osean forces had their sights set on this inoperable railgun from the outset of the Lighthouse War because they believed a single strike from the powerful explosive projectiles it launched could take out the seemingly invulnerable Arsenal Bird after saturation attacks with missiles had failed.

With help from the original developers, Osea finished the repair work in about a month, a remarkably quick feat.

However, the cooling pool used by the facility's dedicated reactor had dried up, which meant it could not be restarted. They solved this problem by bringing in a fleet of trucks mounted with power generators to supply the railgun with the energy it needed to function.

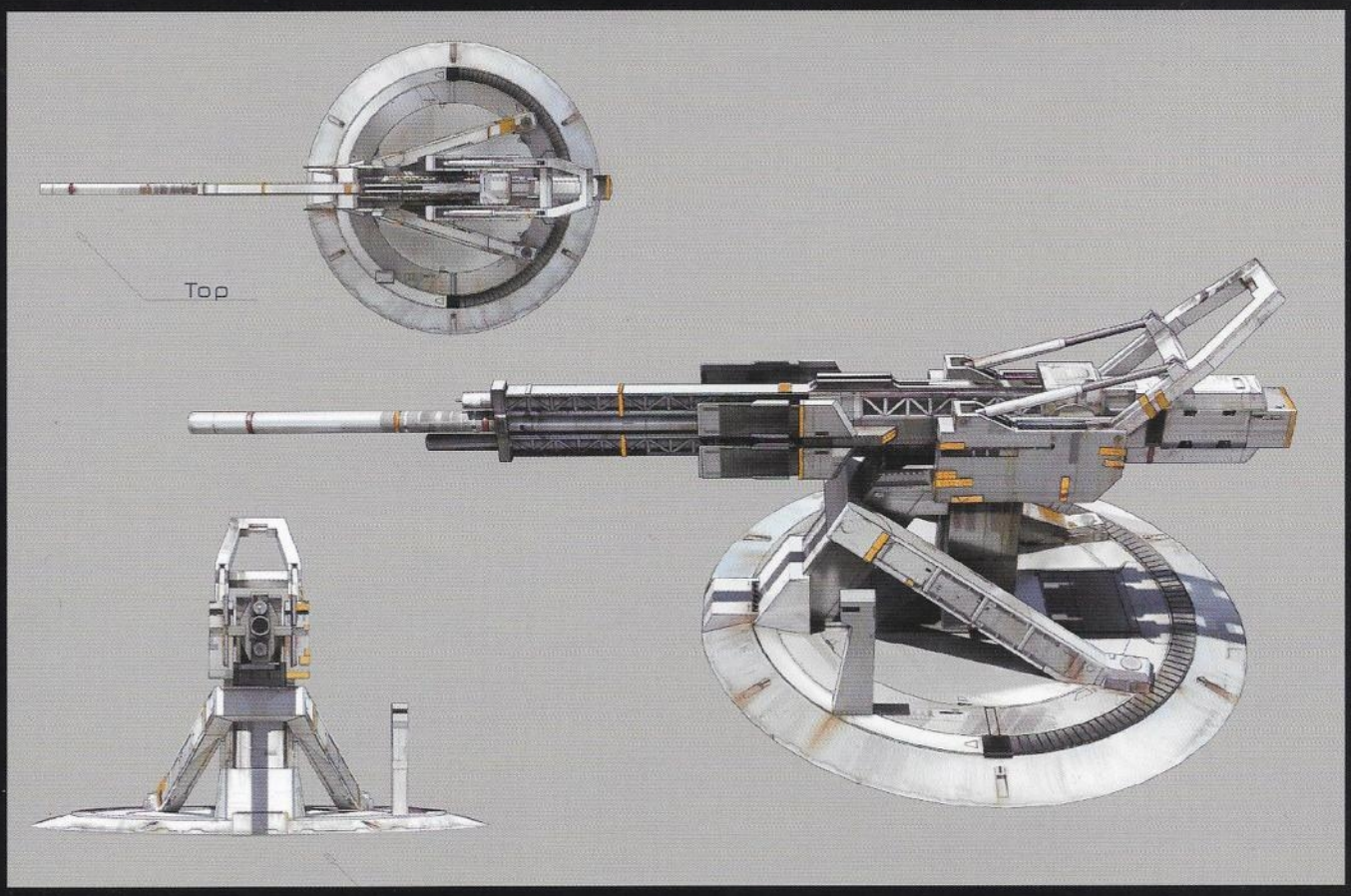
Stonehenge Reborn

Railgun four, which had been damaged during the Ulysses Impact Event, was repaired for use against the Arsenal Bird.

The large section that had been shorn off in the impact was lifted back into place with a giant crane and reattached, and new components were manufactured and installed in place of those that had been damaged.

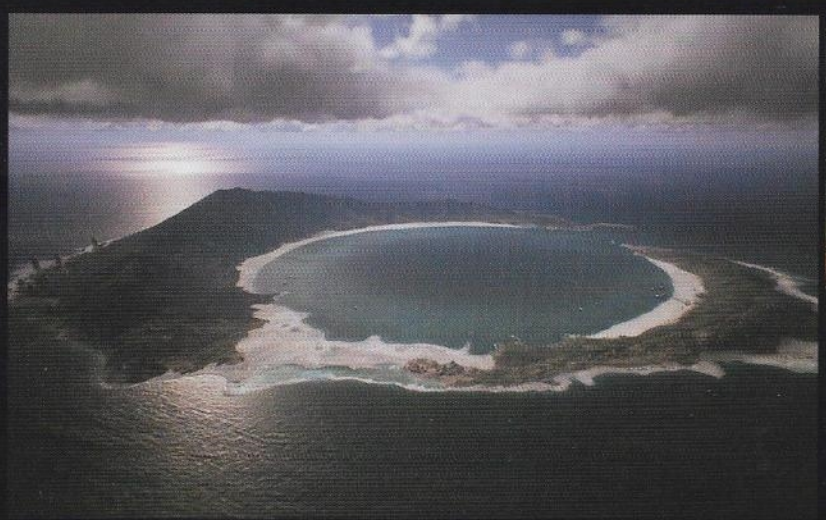
The orange sections shown in the above image are reinforcing composite metal plates used to patch up damaged areas.

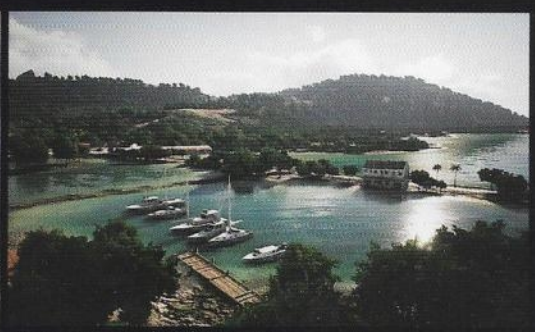
To speed up the repair work, the Osean military and repair unit decided to omit the shell loading and the turret cooling functions. They were staking everything on the firing of the special shell remaining in the launcher.



Roca Roja Base

There is a flatland area known as a mesa within the desert region extending across the southeast portion of the Waiapolo Mountains. The munitions plant, armory, and fuel storage facility located there are protected by a natural fortress of sorts that is formed by the steep cliffs surrounding the valley floor. Known as Roca Roja Base, it had originally been under FCU control until it was seized by Erusean forces.





Fort Grays Island Air Base

The air base is located amid a naval base on an island chain southeast of the Usean continent. It is under FCU control, and the IUN Peacekeeping Forces have been stationed there since the end of the Continental War. The island itself is relatively small, but for the IUN, it is a key joint operations site because of the convenience afforded by having a runway and port within the same base. It is also known as the home port of the FCU's carrier strike group.

The island chain boasts the natural splendor of the South Sea, but it was also the unfortunate victim of Ulysses when a fragment of the massive asteroid stuck a population center on one of the northern islands. The island was obliterated, leaving behind the Newman Crater, one of the largest on the continent.

Osean Air Defense Force 414th Air Base

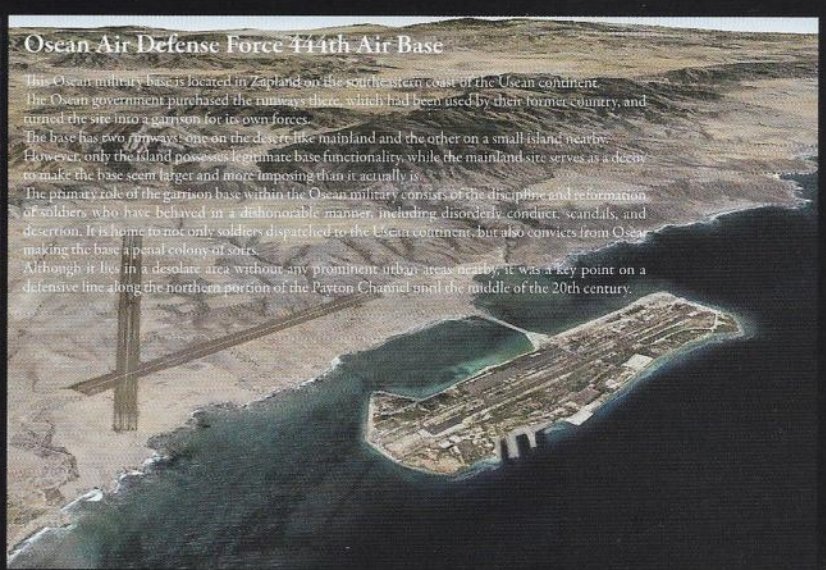
This Osean military base is located in Zaphrid on the southeastern coast of the Osean continent.

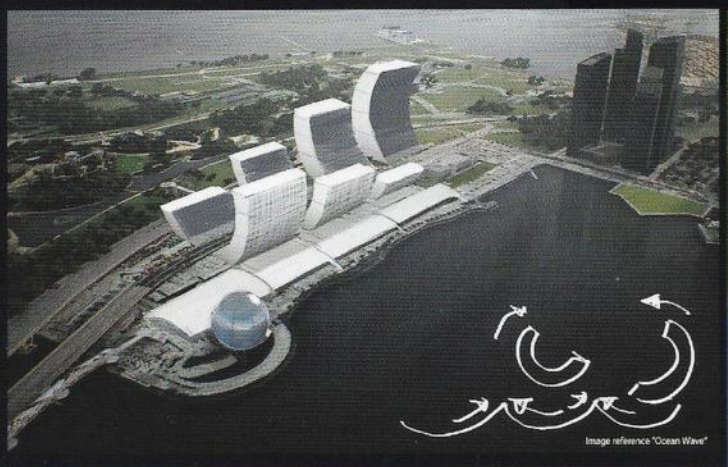
The Osean government purchased the runways there, which had been used by their former country, and turned the site into a garrison for its own forces.

The base has two runways: one on the desert-like mainland and the other on a small island nearby. However, only the island possesses legitimate base functionality, while the mainland site serves as a decoy to make the base seem larger and more imposing than it actually is.

The primary role of the garrison base within the Osean military consists of the discipline and reformation of soldiers who have behaved in a dishonorable manner, including disorderly conduct, scandals, and desertion. It is home to not only soldiers dispatched to the Usean continent, but also convicts from Osea, making the base a penal colony of sorts.

Although it lies in a desolate area without any prominent urban areas nearby, it was a key point on a defensive line along the northern portion of the Payton Channel until the middle of the 20th century.





Selatapura

This massive port city lies near the equator in Gunther Bay in the southern portion of the Usean continent. It has achieved remarkable economic growth in recent years in an effort to overcome the hardships that have continued ever since the Continental War.
As a vital link in maritime transport, the city has extensive container yards for storing cargo along its coastline and a continuous stream of ship traffic.
The central portion of the city features a stadium, a Ferris wheel, and a uniquely designed convention center.
At the end of the sea bridge that starts amid a cluster of futuristic buildings lies a gigantic space elevator soaring into the sky.
The weather there is unstable due to the high atmospheric humidity typical of regions with tropical climates. Downpours are not uncommon.
The region, once part of the former Federal Republic of Erusea, was devastated by an asteroid fragment that struck 20 km offshore during the Ulysses Impact Event.
The resulting tsunami destroyed the city's coastal areas and claimed some 30,000 lives.
After the war, the former Federal Republic of Erusea continued to lose territory to other nations, but this region alone maintained its independence, receiving a massive capital inflow from a multinational conglomerate. As a result, Selatapura experienced GDP growth exceeding 500% over a ten-year period.

Naval Platform

This naval platform off the coast of Snider's Top in northern Usea is a massive structure built by the Continental Nations' Economic Alliance following the Continental War.
When charting a course from Port Edwards on the north coast off Usea to North Point or other destinations, ships often suffered damage from rough seas and ice floes.
In response, the Continental Nations' Economic Alliance decided to build a number of platforms to drill for oil and serve as transit points along the ocean.
The top section consists of a large deck that can be converted to a runway for large air transports when nautical conditions deteriorate to a point where passengers and cargo cannot be carried by ship. For this reason, the platform also has fuel reserves for not only ships, but aircraft as well, along with other facilities, such as a large crane and a floating dock for ship repairs.

Other similarly sized platforms are being built in the nearby fjord valley region with a focus on the docking and resupplying of large ships.
The Kingdom of Erusea seized them at the start of the war, added defensive weaponry and other facilities, and concentrated their main naval force, the Njord fleet, there to prevent an Osean invasion.

IUN International United Nation Peace Keeping Force (IUN-PKF)

Penal unit

Ocean Air Defence Force
506th Tactical Fighter Squadron "Golem"

Ocean Air Defence Force
508th Tactical Fighter Squadron "Mage"

Ocean Air Defence Force
Air Base 444th Squadron "Spare"

Ocean Air Defence Force
616th Tactical Fighter Squadron "Gargoyle"

Ocean Air Defence Force
178th Tactical Fighter Squadron "Skeleton"

Personal emblem for the call sign Trigger

Aircraft emblem for the call sign Trigger

Personal emblem for the call sign Count

Long Range
Strategic Strike Group (LRSSG)

ERUSEA AIR FORCE UNITS INSIGNIA

Ocean Air Defence Force
122th Tactical Fighter Squadron "Cyclops"

Erusea Air Force
68th Experimental Squadron "SOL"

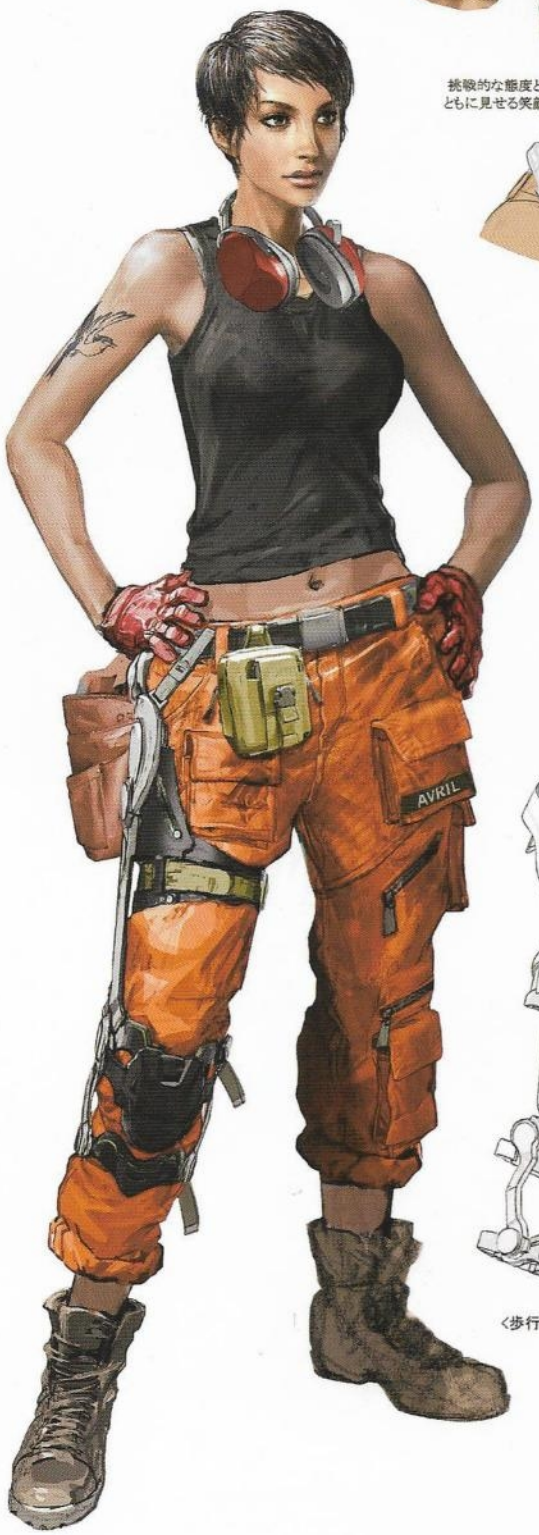
Ocean Air Defence Force
124th Tactical Fighter Squadron "Strider"

LIGHTHOUSE WAR
05.2019 – 12.2019

International Space Elevator Corporation

The Kingdom of Erusea

Voslage Air Force

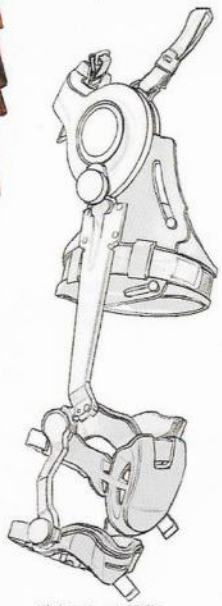


Osean Penal Base Engineer

Avril Mead

The penal unit's mechanic. A dyed-in-the-wool individualist who refuses to give in, defining herself by keeping a healthy distance from everything. She spends her days in the back hangar at the penal base, building airworthy planes from scrap. Her talents have earned her the nickname "the Scrap Queen."

Ever since she was little, she worked with her grandfather and his friends to try to restore an F-104. Their purpose was not to fight but to use it for drag races across the dark blue sky. Her grandfather was once a lieutenant general in the Osean Army. Her father had been a pilot in the Osean Air Force, but died in the Circum-Pacific War. After hearing the sad particulars of his death from her grandfather, she came to hate the Osean forces.



〈歩行アシスト器具〉

Erusean Army Test Pilot
Mihaly A. Shilage

His full name is Mihaly Dumitru Margareta Corneliu Leopold Blanca Karol Aeon Ignatius Raphael Maria Niketas A. Shilage. He was once heir to the throne of a small nation absorbed by Erusea, but became the Erusean military's top ace after the annexation. Though he has retired, he is greatly respected by pilots from similarly annexed countries. The scar across his cheek came not from his time as a fighter pilot but from a gunshot fired by a young man he had trusted as one of his closest friends.

He wears an enhanced flight suit and repeatedly engages in combat with aggressors to collect data. His skill is not that of a man who is just getting his wings back after returning to the sky. To an opponent, he is as merciless as the laws of nature.

Younger Granddaughter: Alma A. Shilage

Alma A. Shilage

Mihaly's two granddaughters have a quiet, distant nobility like the moon hanging in the sky. They live with Mihaly on a remote testing base. Ionela takes care of her grandfather and sister without ever letting them see any signs of weariness. Alma is a portrait of innocence. They are refined, but still smile like children. They made friends with the Erusean princess at school, and she occasionally visits the base to spend time with them. The three are close, but they are aware that Mihaly's feelings toward the Erusean royal family are complex.

Older Granddaughter: Ionela A. Shilage

Ionela A. Shilage

LIGHTHOUSE WAR

05.2019 – 12.2019

Osean Air Defense Force Penal Unit Spare Squadron Pilot

Tabloid

Often referred to as the "political offender" by others at the penal base. He is knowledgeable and offers unusual speculation and conspiracy theories which interest other penal unit members. His parents were both Belkan, but he feels no loyalty toward the nation. They are from Belka, but he is a citizen of Osea.

He always wears a smile, and while it's hard to tell what he might be thinking, he's ultimately good at heart. He is the first to notice Trigger's potential, and does his best to help his fellow pilot's skill blossom.

EASA Testing Base Engineer

Schroeder

An engineer assigned to Mihaly's aircraft, as well as a member of the development team for the Erusean Army's drones. He is a Belkan citizen who was sent by his company to work for Erusea. A scientist to the core.

Because many Belkans hold resentment against the world for the loss of their homeland, he has long watched and sympathized with Mihaly, whose own country was annexed. Even so, he does not carry animosity in the way so many of his countrymen do, taking note of Mihaly's words and deeds from a neutral perspective. However, this neutrality does not extend to ceasing his own use of Belkan technology to gain an edge in war, even if it means putting a great deal of physical strain on Mihaly. There is a riddle within the pilot that Schroeder is determined to solve.

Princess of the Kingdom of Erusea
Rosa Cossette D'Elise

Daughter of the man who ascended to the throne when the kingdom was restored after the Continental War.
Despite their status, the new royal family is looked down upon because they were formerly mere commoners. However, her humble beginnings have left her free of ceremoniousness, making her straightforward and adaptable. Her graceful, relaxed air and use of humor prove she had an excellent upbringing.
If Mihaly's granddaughters are moons floating aloof, then the princess is the warm sun.

DIALOGUE 02

DIRECTOR >—< NARRATIVE DIRECTOR

Graphics Bring the World of Strangereal Alive

Ace Combat 7 features nearly one hour of cinematics designed to draw players into its exciting world. Hibiki Yoshizaki, the director of those cinematics, and Kosuke Itomi, who was responsible for all of the performances in the game as its narrative director, paid a visit to Sometime, the bar where Mihaly breaks the silence with his line, "Yet, what is a nation?"

khara, Inc.
Director/Cinematic Director
Hibiki Yoshizaki

Going from Anime to CG + Live Action for Ace Combat

Yoshizaki: Before you invited me to work on Ace Combat 7, I also served as the movie director for Ace Combat Infinity. There were no full-body depictions of actual characters in that title, so basically its history and setting had to be conveyed entirely through the GUI (graphical user interface). I had served as a GUI and motion graphics designer on various anime and other works, so I was eager to put my skills to use as I got to work alongside the studio flapper3. However, while I was working on the game, I gradually began wanting to portray more character-based drama.
I remember speaking with you about the subject at a kickoff meeting or some other event. I mentioned how I wanted to describe the scenery of this science fiction-based world by focusing on the people within it, much like in the film La Jetée, while giving it an artistic, indie filmmaker feel. We shared a lot in common regarding our thoughts on La Jetée, and you later asked me to come work on Ace Combat 7. Was it because of that initial conversation?

Itomi: I asked you for other reasons as well. First of all, since you brought up La Jetée, please allow me to talk about the history behind the production of the cinematics for the Ace Combat series. Naturally, since Ace Combat is a game about fighter aircraft, it mainly takes place in the skies. However, most of the story itself takes place on the ground, so it requires different art and background assets. Therefore, it is not always possible to utilize the same modes of expression that are used within the game portion. We have to consider various methods and techniques according to the concepts and themes of the story. On the other hand, we are given a lot of freedom to select from those techniques, and even though this is a franchise, we can change our expression methods according to the theme of each particular game. Ace Combat 3 was the first title in the series to put an emphasis on adopting more story elements. We used animation to create various methods for the characters to interact, such as through the cinematics and videophone conversations. The game is well-reviewed today, but opinions on it were divided at the time of its release. It was because its use of animation and a science fiction setting differed greatly from Ace Combat 2. Based on that feedback, we started development on Ace Combat 04 (AC04). In regards to its cinematics, I talked with AC04's art director Kazutoki Kono (the brand director for Ace Combat 7) to see if there was another approach we could take that did not entail the use of animation or CG. We talked about using video footage made from war photos, which caused me to recall that the technique had been used to great effect in the movie La Jetée. We immediately decided that was the way to go. However, there was nobody in the company capable of making such footage. The development schedule was tight and we couldn't afford to waste any time, so we contacted numerous animation production companies and eventually met with STUDIO 4°C. I remember Mr. Kono going so far as to call companies in the yellow pages (laughter). He would ask them if they had anybody who was familiar with fighter aircraft, and that's how we were introduced to Sunao Katabuchi.

Yoshizaki: The yellow pages? (laughter) That must've been when Mr. Katabuchi was making Princess Arete at STUDIO 4°C. At that time, I had never met Mr. Katabuchi personally, but I was often helping out on various projects at 4°C around then.

Itomi: I guess we just missed each other (laughter). That was the beginning of our relationship with Mr. Katabuchi. In the AC04 cinematics, the player's rival, Yellow 13, was depicted as seen through the eyes of a young boy. Instead of portraying the player on screen, Yellow 13 speaks about the player in his dialogue. This technique that Mr. Katabuchi used to tell the story served as the basis for cinematics in future Ace Combat titles. AC04 went on to receive global critical acclaim. Shortly thereafter, we began working on Ace Combat 5. We asked Mr. Katabuchi to handle all of the story, while at the same time expanding the scale of a large overarching war between multiple superpowers. By the time I joined the project, a rather large scenario had already been completed and the script was as thick as a phonebook. Upon taking a closer look, I realized that the theme of AC5 was "friendship" and that it would be necessary to portray people within the cinematics. It was also somewhat like a road movie, in that it featured a rich variety of locations throughout the story. In order to visualize such a detailed world, we decided to go straight to pre-rendered CG video for the cinematics.

We assembled a team consisting of people from inside and outside the company, and although we weren't used to such a process, we made almost everything internally. It was tough, but thanks to that experience, we were able to gain the knowhow and staff required to produce such long-form cinematic scenes. Immediately after that, we worked on the title known internally as Ace Combat 5.5. Actually, the development of AC5.5 and Ace Combat 6 occurred concurrently. Unlike its predecessor, AC5.5 was a fairly small-scale project. It had a shorter development period and a smaller budget, and the team was much smaller as well. Although, when you're faced with less of everything, the development process becomes more agile and you can move more quickly (laughter). We managed to write most of the story and structure of the game within just a few days.

Yoshizaki: I see... So that's the title that became Ace Combat Zero. I suppose at the time you didn't imagine you were working on something that would become so big (laughter).

Itomi: You can say that again. It was due to the freedom they gave us to work on the project (laughter). Unlike its predecessor, AC Zero used live-action video for its cinematics. We didn't have the budget to create highly dramatic scenes, so we decided to use a documentary style instead. We referred to various video recreations and interviews used to create documentaries to come up with the idea of interviewing multiple characters about the player. However, at that time, most games featured elaborate pre-rendered CG cinematics, so our use of live-action footage was frowned upon. We decided to give the footage a picturesque look to make it appear more like CG, which managed to minimize the opposition regarding our choice.

Actually, we originally had a plan to make the characters in CG and set them against live-action backdrops. However, there was the opinion that interviews featuring real live people were more persuasive, so that suggestion was eventually scrapped. It does lead into the development of AC7, though. Afterwards, Assault Horizon (ACAH) adopted the use of real-time rendering for all of its cinematics. With the ACAH cinematics, I thought about seamlessly switching between first person and third person perspectives within the game itself in order to create a sense of immersion by eliminating in-game breaks that would take players out of the moment. It also forced me to rethink my approach to camera blocking the scenes. We introduced a virtual camera and looked to use a long continuous take for the characters' performances. Although it was CG, I remember looking forward to shooting the footage. That's when I talked to you about the project. It's been eight years already. After a short period of time, development started on Ace Combat Infinity. We decided to try developing the story through the use of motion graphics. I reached out to you and you introduced me to Yota Suzuki over at flapper3, which led to the formation of our current video production team. In this way, we changed the methods utilized for the cinematics in various ways, but at first I was thinking of using something like the animation-based approach of AC04 for Ace Combat 7 as well. I had an image in my mind of combining the work of AC04 and AC5. However, I talked to Mr. Kono and he said he wanted to use full CG. I told him, "You mean like Ace Combat 5's CG? There's no way we can do that!" (laughter)

Yoshizaki: Really?! You were originally thinking of using animation? I had no idea! Right before you officially invited me to work on the project, I had decided to join Studio Khara, which I thought would be a good place for me to work on anime, but then you mentioned that the project was going for a photorealistic look.

Itomi: I was unsure how to proceed, so I watched movies and other videos every day before I finally came across a work from a certain Italian filmmaker. It was like the video record of a journey, with the scenes depicted in a deliberate order, one after the other. The characters didn't speak, but there was a voice in the background reciting something along the lines of poetry. I thought it was an incredible piece of editing. The game was using a narrative base to tell its story, so I thought this particular method would be a good way to impart the scenes with some additional depth. In some ways, it was more like a commercial or music video shoot, with the materials drawing from a mixture of CG, photographs, and live-action footage arranged in a dramatic fashion. As such, you were the only person I knew who could make that vision a reality.

Bandai Namco Studios

Kosuke Itomi

Yoshizaki: I thought that the film was wonderful and wanted to use it as inspiration, but when I first saw the story for the game, its scale was much bigger than I anticipated. I figured I'd never be able to create the necessary scenes using that particular method as our main approach (laughter).

Although the game uses cinematics from the viewpoint of its characters to advance the story, it actually includes a much broader story between continents that progresses in real time along with the game rather than taking a retrospective view. Therefore, I figured that focusing on the scenes themselves would make it difficult to convey the game's supporting characters and setting to the player. Mr. Katabuchi's story was rather complex with many underlying messages, so it required a lot of inference. Therefore, I felt it was necessary to have somewhat easily understood character portrayals and performances in order to let more players enjoy the game's expansive worldview.

Afterwards, Bandai Namco Studios introduced me to the CG studio ILCA and we began development by getting the core staff accustomed to working with live-action shoots. Normally, I ask a production company to shoot such footage for us, but we decided to give it a try ourselves first. However, since the team was made up of CG studio staff and people with anime backgrounds, we had quite a bit of difficulty with the live-action shooting. We engaged in many individual test shoots and compared our notes in a desperate attempt to learn it as we went (laughter).

Although I tried various shooting methods, scene depictions, and stills with the premise of superimposing CG-generated characters upon them, there was always something that didn't quite match the game's setting. Furthermore, we were limited with our shooting layouts, so the composition and reconciliation processes demanded a lot of corrective work. Shooting on location also required a lot more time and money than we expected. In the end, we decided it would be too difficult to incorporate all of the various things we had originally been considering. Therefore, we focused on the dramatic scenes and character portrayals as our top priority, and proceeded to shoot as much extra background and object footage as we could during the on-location shoots. As a result, I think all the titles in the series enjoyed a bit of differentiation, with AC04 using anime, AC5 being in full CG, AC Zero comprised of actual people against CG backgrounds, and now this title featuring CG people on photorealistic backgrounds.

Itomi: It's also narration-based, so in a way, it's the ultimate culmination of AC04, AC5, and AC Zero. Of course, it also caused the budget to spike considerably (laughter).

Yoshizaki: Indeed it did! I was hounded by that fact pretty heavily (laughter). I previewed it once I had all of the sequences finished to a certain extent, and it was not yet at the level of quality I was aiming for. I'd say, "This is no good. We can do better on this part."

Itomi: Or things like, "This has yet to reach its full potential."

Yoshizaki: However, we'd already exhausted our production budget. Fortunately, we were able to scrape together some extra funds and managed to add some overall polish to things by brushing up the higher quality effect shots, performing some additional editing, and using bolder color grading to bring it up to its present state.

How did you translate the script to the screen?

Yoshizaki: In order to visualize a story, you usually need to have your characters actually in the locations where the story takes place. However, when the camera focuses on the characters themselves like in a documentary, you have to be careful how the story is portrayed because you can only show what is actually around them since the camera is focused on them alone.

I really felt that
Ace Combat 7 deals with some pretty complicated topics.

Hibiki Yoshizaki

Director/Cinematic Director khara, Inc.
Born: March 10, 1980

He worked on the mech designs and as the monitor graphics director for Evangelion: 3.0 You Can (Not) Redo and has a large number of other director and art-related credits for various music videos and anime productions, including Macross Frontier. He is best known for his work on the third episode of the Japan Anima(tor)'s Exhibition, entitled "ME!ME!ME!" as well as the 31st episode "Girl," and Hikaru Utada's song, "Sakura Nagashi Eva:Q ver." His first experience with the development of the Ace Combat series was Ace Combat Infinity. For Ace Combat 7, he served as the cinematics production director, where he was responsible for visualizing the script on screen.

At first, the story had not been finalized and the characters, environments, setting, and other aspects were still being developed, so I spoke with you and Mr. Kanno (the art director for Ace Combat 7) about the overall composition and setting. That allowed me to create storyboards and decide what kind of visuals to make. Since the game uses photographic backgrounds, the on-site locations didn't always follow what I had drawn, but I felt the most important thing was to follow the story of the people on the ground, much like in the beginning of the story when Avril is about to launch the F-104 that she restored into the desert sky. Personally, I wanted to create bold scenes full of gorgeous visual effects, but the game required a style that was more like a cameraman filming on a tripod. As such, I convinced myself that it was easier for players to enjoy the world we depicted if the focus was on the characters, just in case the visuals turned out to be somewhat lackluster (laughter).

Itomi: Cinematics are an important element used to pull together the image of the overall game, so I think it must have been difficult to pull that portion out on its own like that. While you were worrying about how to portray the cinematics, I was still concerned with the overall structure. First of all, the structure sets the framework for the overall game and the basis for its composition. You need to map the overall flow that properly balances the placement of the cinematics and creates the framework for each mission. We then take those frameworks and meet with Mr. Katabuchi and the rest of the development team, at which point all of the elements within them pretty much get thrown out (laughter). We then use the results of the meeting to repeatedly revise and refine those frameworks. The director works on the gameplay for each mission and finds ways to combine it with the story. After that, we work with the level designers and the radio script staff to fill in the details of each phase. The other thing that Mr. Kono is constantly asking me in regards to Ace Combat's development is, "How will this make the players feel?" The most obvious approach is to align the missions so they create emotional arcs for the players where they can feel like they are gradually becoming an ace pilot as their fame grows and the enemy responds to them over time.

Yoshizaki: In anime and movies, the role of narrative director is just as complex as that of the director and requires that you take a central role in the title's development, but I think game production is an equally large endeavor, with many people involved in a game's creation. Do you ever find that your original intentions were off, or perhaps that things didn't go the way you planned?

Itomi: Nope, not at all (laughter). In my first meeting with Mr. Katabuchi, I showed a rough framework and some reference footage of what I had in mind, and I talked about the plot outline and the method for the cinematics. In response, Mr. Katabuchi said, "We need to keep a firm grip on how we tell the story. Conversely, it's better to have the visuals portray something else entirely." It was definitely unexpected, and I considered that to be a pretty sophisticated request.

Yoshizaki: That sounds incredibly difficult! (laughter)

Itomi: It was... I suppose I was a bit naive, but in the beginning, I thought there wouldn't be many characters in the game, maybe two or three main characters at most. There are two engineers, and there are viewpoints from both the enemy and allied perspective. Also, it was the opposite of the way it is now, but the setting called for the penal unit to be the enemy. I had thought of the story in somewhat simple terms, but as I spoke with Mr. Katabuchi, I realized just how complex it was and how much depth there was to the characters themselves.

As I spoke with Mr. Katabuchi,
I realized just how deep [the story] really was.

Kosuke Itomi

Bandai Namco Studios
Born: September 19, 1974

He has worked on the Ace Combat series since Ace Combat 3 and also served as the art director for Ace Combat Zero. He assumed the role of narrative director on Ace Combat 7 and oversees the production of promotional trailers for the series. His other credits include titles in the Ridge Racer and Tekken series.

DIALOGUE 02

Yoshizaki: Actually, as I asked about the circumstances regarding the story changes, I began to think more and more about how this was a story I wanted to tell. It kind of went against the theme, but I felt that since the characters and worldview were so concretely described in the script, it was a waste to obscure them with somewhat abstract expressions. I thought that they should be portrayed faithfully rather than trying to be eccentric, so that they could be readily accepted by as many players as possible.

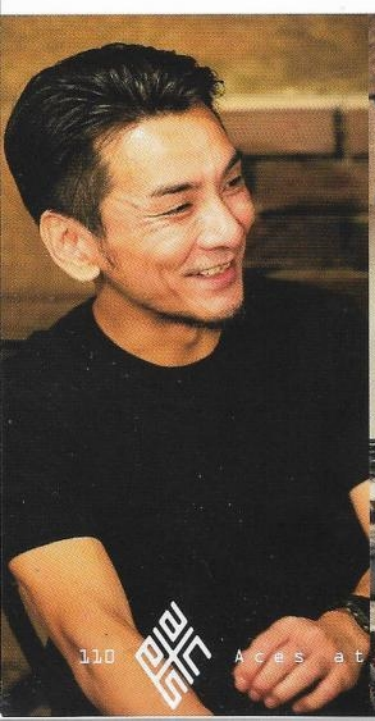
Itomi: I showed the finished cinematics to Mr. Katabuchi (Pg. 134 in this book), and he found the characters very easy to empathize with.

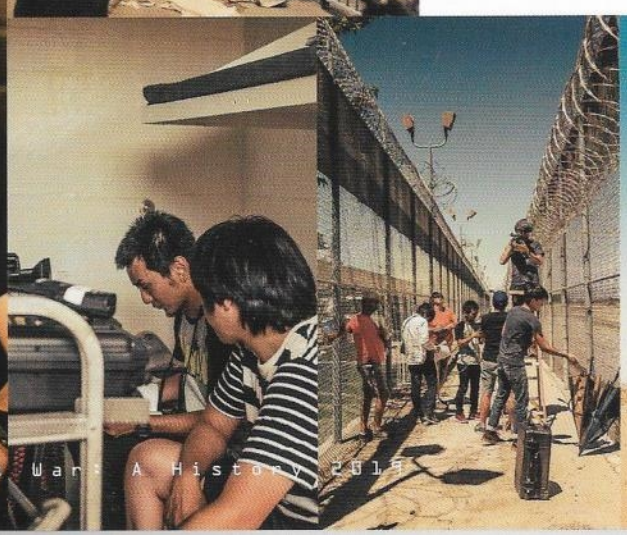
Yoshizaki: I'm relieved to hear it. It varied from the theme a bit, so I was afraid he'd say something like "This director doesn't understand anything!" I was really worried about it for a while (laughter).
While I was working on the production, I could really tell that Mr. Katabuchi had a firm grasp of the characters and the setting in his head. Not just from an entertainment perspective, but I also felt that he raised some interesting questions about society itself. Not whether it is good or bad, but how a sense of order is maintained by recognizing the diversity of people and nations and proceeding with a mutual understanding, or at least, that's how it should be. At the same time, it is important to not let ourselves be sucked in by the foolishness of those unable to do that or by the unilateral aims of countries and organizations. As members of society, people need to ensure that they do not give in to such stereotypes. I really felt that was a powerful message contained within the story.

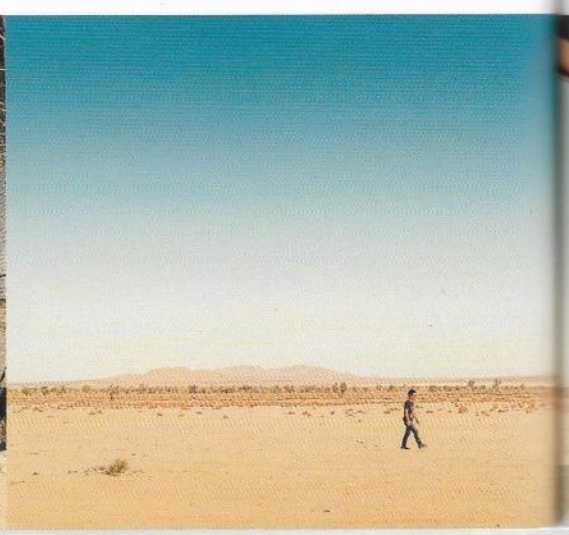
Itomi: The story basically asks what happens when there is a breakdown of order. It really is a difficult subject to cover in a video game. Take the military for instance. It is an organization based on order. So in that regard, games like Ace Combat or other military-themed titles tend to have a predetermined development flow. There are briefings and you're given orders from a superior. You follow those orders and achieve results, so there is a logical flow involved there. However, when you have a story that kind of turns all of that on its head, it leads to changes in the way that the overall game is played.

Yoshizaki: Definitely. It might differ somewhat from the original plan, but the player, Avril, and Cossette all play very important roles in the new sense of order that is formed. Usually, you think of games as requiring simplistic goals, such as defeating the bad guys and leading your side to victory. However, I really felt that Ace Combat 7 deals with some pretty complicated topics. On top of that, it needs to be entertaining, so there is a possibility that players might be turned off if the end product becomes too preachy in a sense. I felt that really made it difficult to find the proper balance. I remember being quite concerned with how to deal with Mihaly, Schroeder, and the rest of Erusea. Ostensibly, they are a threat to the player, but they have their own history, ideas, and outlook on life. That made it impossible to make this a simple story of good versus evil, so it was hard to find a way to effectively express the viewpoints of both sides.

As members of society, people need to ensure that they do not give in to such stereotypes.
I really felt that was a powerful message contained within the story.







Itomi: Indeed, the Ace Combat series hasn't really been known for featuring simple morality plays with its stories. Yellow 13 in AC04, Pixy in AC Zero... They have their own reasons for fighting. Even with Mihaly or Schroeder in this game, although their behavior may be considered selfish, I can at least understand where they're coming from.

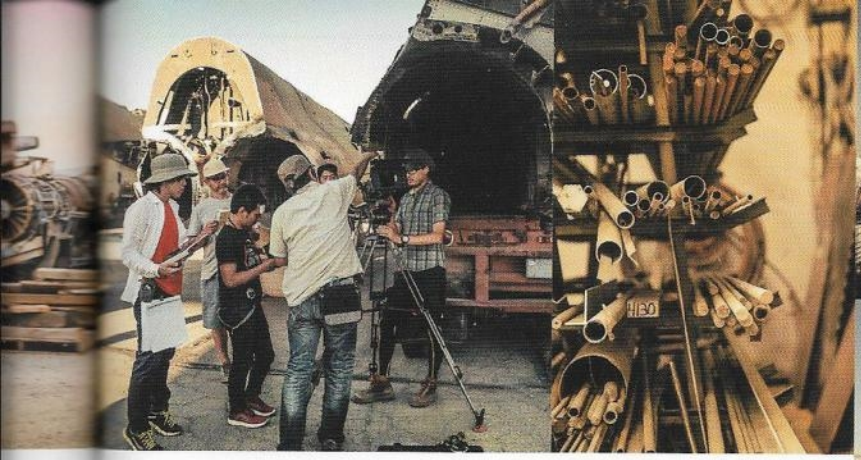
Shooting on Location at Home and Abroad

Yoshizaki: I didn't expect it to be so hard to decide on shooting locations (laughter). At first, I narrowed down the location candidates by using the internet, but I found it was impossible to know whether they matched the setting, were suitable for shooting purposes, or even compatible with our budget. In the end, I actually had to go check out each of them to find the answers I was looking for.

Itomi: In the beginning, we were looking to use a private airport in the United States to shoot a scene that takes place in Schroeder's hangar, but we learned that we would have to pay for the cost of moving all of the aircraft out of the shoot. It would've cost several million yen per day! There's no way we were going to get that approved! (laughter) Fortunately, a company here in Japan was able to help us out. The underground facility where Tabloid and Avril are talking also took a considerable amount of time to reach a decision. We even looked at locations such as the equipment room in our office, which nobody had even set foot in before.

Yoshizaki: Thank you for letting me see such a sacred location (laughter). That's the scene in the 444th Air Base where Avril says, "I don't intend to be choked to death here in this putrid air!" Therefore, it was necessary to portray it as a dirty and unusually harsh space. I was able to locate some places in the U.S. and I found a nice studio for our purposes, but I had to give up on them due to the budget. Luckily, I found an abandoned building in Chiba that was just what we were looking for. I wasn't expecting to find such a spot right in our own backyard (laughter). Although, in addition to being pretty cramped, it was way too dark to shoot. Fortunately, our main cameraman for the cinematics, Mr. Fukazawa, was able to provide enough lighting for us to finish the shoot.

Itomi: That really turned into a memorable scene. And don't forget about Izu Oshima Tyler Island! (laughter)



Yoshizaki: Yes, a portion of that scene on Tyler Island is really just Izu Oshima island completely untouched. Actually, there are a number of shots like that (laughter). However, most of the shots are processed to such an extent that the source images barely even register. The CG director for the cinematics on the project, Mr. Ayukawa, used to be a lighting artist, so he was quite knowledgeable about merging actual images and CG, and his expertise on lighting and color matching proved invaluable. When the shooting requirements such as the lighting information don't match with the CG to be added, the end product will be inconsistent, no matter how much post-processing you apply. So it's only because of Mr. Ayukawa and the rest of our staff that we managed to pull it off.

Itomi: I think the fact that we used live footage was a big advantage in terms of speed and flexibility. There were things that could be considered while the work was still being done. Especially with the final scene, there were many changes to the direction in unexpected places.

Yoshizaki: When creating a scene, it invariably happens that you insert a shot or other imagery that was not included in the original plan, and you find that it is more effective to change things up after seeing the product come together. That's why it's important to have such flexibility. The more authentic a location is, the more staff you require, meaning that you end up losing some of that flexibility. This is an unavoidable problem because the shooting schedule takes priority, but I think our staff remained flexible whether in Japan or overseas, so we were able to keep that mobility intact. In addition to being coworkers, Mr. Fukazawa and I are good friends outside of work as well, so he always knew exactly what kind of shots I was looking for and I was able to ask for things that would normally be hard for anyone else. In some of the locations, it was only me, Mr. Fukazawa, and Mr. Sekitani, the cinematics producer (laughter).
We also utilized photos taken by the staff, and I even used some videos I shot with my iPhone for reference. We ended up using quite a few different formats to create the final footage. The evolution of camera equipment for home use has been quite remarkable, making it easier than ever for people to create professional-quality movies. That makes it easy to capture footage when the moment arises, giving it a sense of spontaneity that isn't found with more meticulously detailed shoots. Therefore, you don't need to miss out on the perfect shot when you're presented with it.

Conveying a Sense of Values

Itomi: I enjoy moments in movies that are thrilling, but I also like the more relaxed scenes where time itself seems to stop. For example, I obviously like watching the battle scenes in the Evangelion series, but I also like shots such as ones that simply show the ceiling in the hospital. While looking at such scenery,

[Players] will begin to interpret the story's meaning and eventually gain an even deeper understanding of the game's world.

I often consider the feelings of the characters and reflect on the story so far. I like having that time to contemplate what's going to happen next. I noticed a number of such scenes in these cinematics as well.

Yoshizaki: I feel the same way! I also like scenes featuring little action that let the viewers share in the hopes and fears of the characters at that moment. When you have such depictions, it really adds a human side to your characters. Ever since I read the story for this game, I thought about the importance of creating "moments" to examine the situation that characters such as Avril, Schroeder, and Cossette found themselves in, so as to gain an understanding of what they see, think, and feel.

Itomi: Entertainment has evolved rapidly over the years, and nowadays it seems that many productions barely even give viewers a chance to catch their breath. While they can be interesting to watch, I like to have performances where each viewer can find their own sense of drama within them.

Yoshizaki: It's a difficult balance. I feel that it is necessary for users who are used to modern entertainment, especially younger people, to be able to express their own ideas and also consider other forms of expression to be equally valid. Of course, the theories behind things such as direction and relevance are important as well, but as a creator, the toughest part for me on this project was finding the best way to express my thoughts in a clear and cohesive manner. As opposed to simply pursuing the realistic depictions that were the theme of the game, I felt it was more important to utilize some of the slightly exaggerated performances and drama you might find in an anime while using ambient light to give the characters a greater sense of presence, thereby giving this title its own version of reality. I'll have to wait and see what the players think before I can judge whether I was successful or not, so even though my work on the cinematics is finished, I'm still pretty nervous (laughter).

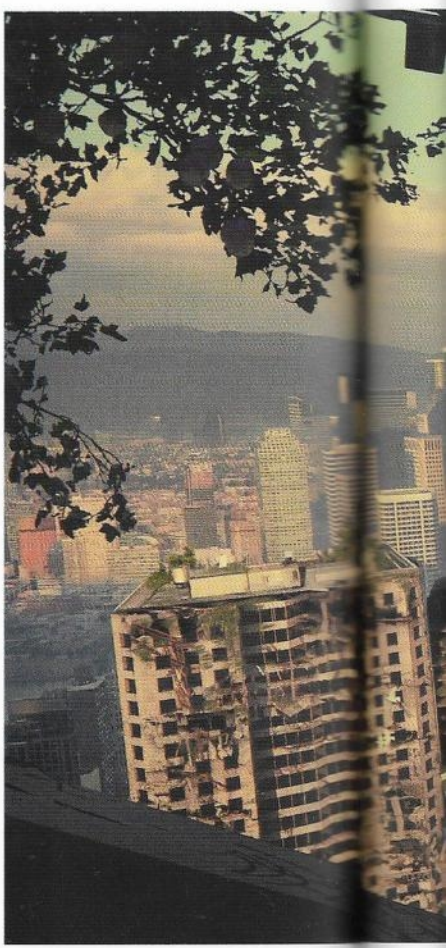
Itomi: Actually, the reason we incorporated actual footage wasn't just due to the costs. Although Ace Combat's setting is fictional, it features real world locations such as this bar Sometime in Kichijoji, the warehouse, or the prison, and then superimposes them with CG characters and fighter planes to create a living, breathing, virtual world. In a way, it feels somewhat familiar to us, which is why I decided to use this particular method.

Yoshizaki: I can't wait for people to play the game. In fact, I can't wait to play it myself (laughter). As a part that makes up the overall game, I hope the cinematics help them enjoy the rich story and setting that Ace Combat 7 has to offer.

Itomi: This game is packed with much more story and information than its predecessors. The story is embedded deeply in each and every word and phrase found in the script. As players pay attention to them alongside the visuals, I think they will begin to interpret the story's meaning and eventually gain an even deeper understanding of the game's world.

The Battle of Farbanti

Some chose to abandon their old lives and dwell at Laker Crater. As the Osean army advanced, the front line moved to the Erusean capital of Farbanti. Erusean troops call for evacuation from the ruins, and another paradise is lost.



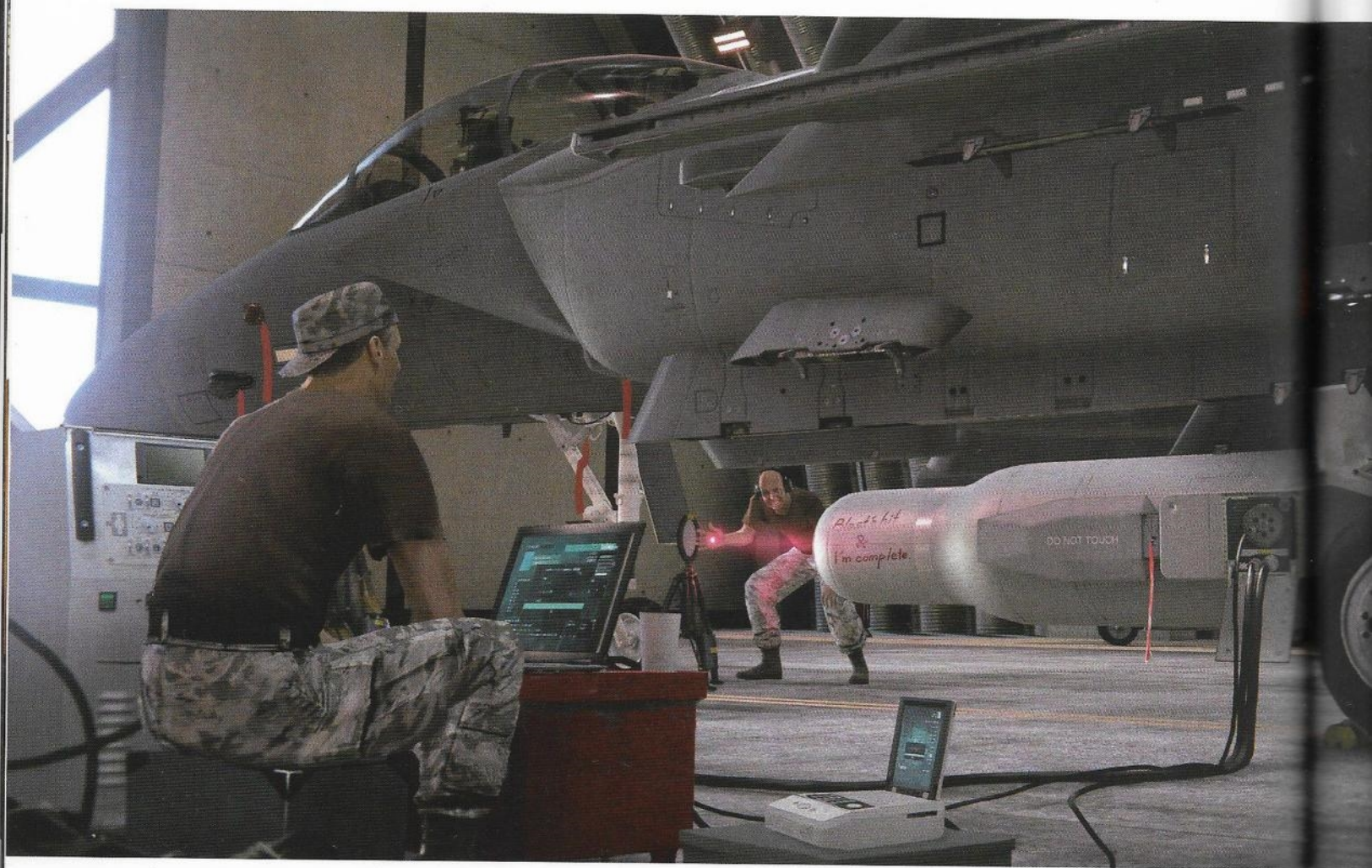
Erusea's Preemptive Strike against Osea

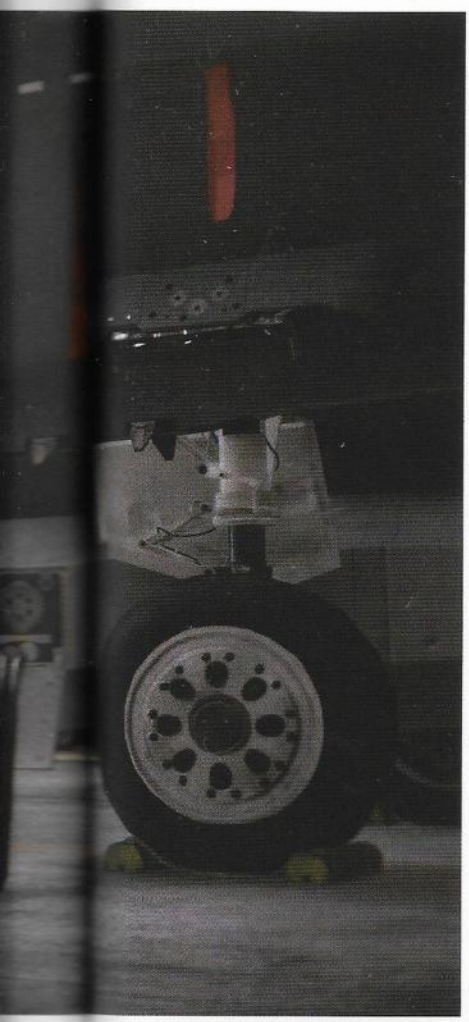
A group of drones bombs Port Saint Hewlett in western Osea. This photo was taken from a passing train. Success in early development of small unmanned combat aerial vehicles was the key to Erusea's bold opening attack. They were smuggled in with cargo containers and brought to their destinations by road or ship, allowing them to make surprise attacks without being intercepted. The deadly packages had been delivered to locations around the world, and the populace recognized quickly that nowhere was safe.

Developing the Seventh Generation

Completely autonomous AI is the current trend for next-generation fighter concepts. Various nations have already begun development on test aircraft, and defense contractors are engaged in fierce competition. In addition to high maneuverability and anti-stealth technology, there is a pressing need for aircraft that act autonomously when disconnected from the network.

If AI reaches the point where it can think, act, and survive on its own,then there will be no room for humans to intervene on the battlefield. It is no longer tactical officers or aeronautical engineers leading development, but computer engineers.





If it can fire and score hits, then it's complete.

A team of mechanics stationed at an Osean Army base in southern Usea install new weaponry on fighters. While not as large as the shift to UAVs, armaments for traditional fighters have started to change. Most, though, have not been thoroughly tested, making the battlefield their first real proving ground.

Article: State-of-the-Art Fighter Aircraft Development

The Key to Victory Lies in Software Development

Development Costs Approaching Several Trillion Yen Necessitate a Move Towards Joint International Development

Modern fighter aircraft are one of the single most expensive items a country can purchase today. The F-35A Lightning II is a state-of-the-art stealth fighter that is already in use by several countries, including the U.S. Air Force and the Japan Air Self-Defense Force. As part of the 10th Low Rate Initial Production, or LRIP-10, the cost for a single fighter came in at 94.3 million USD (approximately 10 billion yen).

When compared on a per unit basis, vehicles such as destroyers and aircraft carriers are far more expensive, but the military must order fighter planes in much greater numbers. Furthermore, the fuel and maintenance costs for such planes are exceedingly high, with the associated running costs over the several decades of their lifespan nearly approaching their initial purchase price. Therefore, in order to deploy these fighters in large numbers, it will likely come down to what concessions the Ministry of Defense bureaucrats are willing to make in their negotiations with the Ministry of Finance.Easily the most burdensome cost of modern fighter aircraft is their Research, Development, Test, and Evaluation (RDT&E) phase. RDT&E (hereafter referred to as "development costs") refers to the costs associated with designing a new fighter aircraft. As an example, the development costs for fourth generation fighter aircraft, which are currently playing a key role in militaries around the world, were several hundred billion yen, although it depends on the model.

However, with the more modern fifth generation fighters, that figure has actually increased tenfold. The development costs for the F-35 until it reached full operational capability (FOC) with its Block 3F phase totaled 55.5 billion USD (approximately 6 trillion yen). That is more than Japan's entire annual defense budget of approximately 5 trillion yen. Even considering any sacrifices that cabinet members might be willing to make in other areas, an amount equal to 600 fighters valued at 10 billion yen each is not one that can realistically be included in the budget. As such, the era of countries developing their own manned fighter aircraft, such as France's Rafale and Sweden's Gripen E, is likely coming to an end.

Such countries will need to upgrade their fighters to newer models eventually. For this reason, it is expected that in the future, the development model will change to one where multiple countries share the development costs. Even though the United States led the development of the F-35, many other countries also budgeted for it. Since more than 3,000 F-35s have already been ordered, the development costs per each unit are rather small.

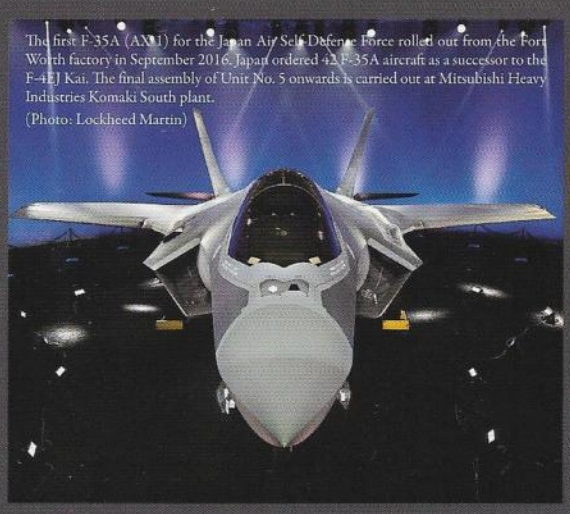
Additionally, the next-generation successor to the Eurofighter Typhoon known as the "Tempest" was unveiled at the Farnborough Airshow in the United Kingdom in July 2018. However, the UK seems to be unwilling to shoulder all of the fighter's development costs on its own and is already in talks with other countries to engage in joint production efforts. Among them is Japan, which has so far refrained from selecting a successor to its F-2 fighter.

The reason such large expenses are so difficult for bureaucrats and cabinet members to swallow is because the country's citizens strictly audit the use of taxpayer funds to ensure they are being wisely spent. In other words, countries that are able to ignore their citizens the most are likely the ones that will continue to develop fighter aircraft on their own. This includes countries like Russia and its Su-57 program, but especially China, which is working on the J-20 among other aircraft and has both the motivation and the funds to continue developing its own technology, making it a country to watch in the future.

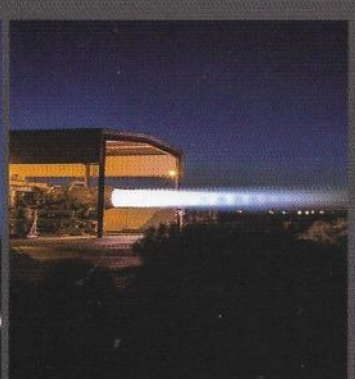
Software Development Is Responsible for the Sharp Increase in Costs

Why have the development costs of fighter aircraft become so expensive? The biggest reason seems to be the software (Operational Flight Program, or OFP) that runs on the mission computer. The functions of modern fighter aircraft are controlled by the OFP, meaning that even if a plane's hardware is state-of-the-art, it will be unable to reach its full potential without the proper software. It is much like having the latest high-performance gaming system, but not having any games to play on it, rendering the system into a mostly useless box.

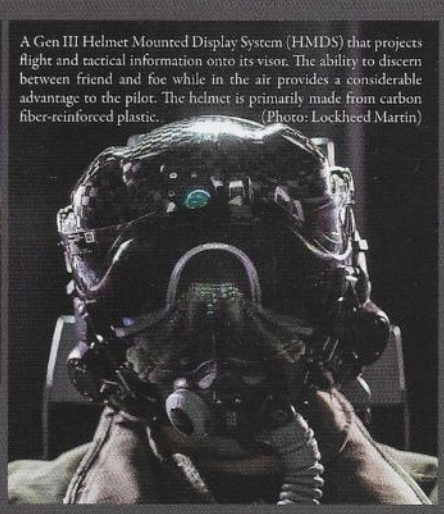
The development of Operational Flight Program software requires what is likely the most difficult software programming in all of the world today. That is because even though bugs are a given when it comes to computer programming, there is zero tolerance for them in this particular software. Imagine for a moment that you are a fighter pilot flying one of these machines. All of a sudden, the multifunctional displays turn blue and are completely unresponsive to input in the middle of a life and death situation. When considering such a harrowing scenario, it is easy to see why software bugs are not allowed in such systems. Although it was not due to a software bug, the first aircraft containing a digital flight control (fly-by-wire) system developed in Japan, the T-2 CCV, nearly crashed shortly after takeoff during its maiden flight after reacting too sensitively to the pilot's input (you can see video of the plane by searching for T-2 CCV on YouTube). There are a fair number of accidents that have been caused by software-related problems. Therefore, it is necessary to first program a certain function and then evaluate it in incremental steps after performing numerous test flights before



The first F-35A (AX-1) for the Japan Air Self-Defense Force rolled out from the Fort Worth factory in September 2016. Japan ordered 42 F-35A aircraft as a successor to the F-4EJ Kai. The final assembly of Unit No. 5 onwards is carried out at Mitsubishi Heavy Industries Komaki South plant.
(Photo: Lockheed Martin)



An F135 turbofan engine developed by Pratt & Whitney Corporation for the F-35 conducts ground testing at Edwards Air Force Base (California, United States). The engine not only produces thrust, but also provides the hydraulic pressure that moves the control surfaces and serves as the power source that drives the electric generator, making it the heart of the aircraft.
(Photo: Lockheed Martin)



A Gen III Helmet Mounted Display System (HMDS) that projects flight and tactical information onto its visor. The ability to discern between friend and foe while in the air provides a considerable advantage to the pilot. The helmet is primarily made from carbon fiber-reinforced plastic. (Photo: Lockheed Martin)

the Operational Flight Program can be considered battle-ready (the F-35's OFP was written in the C++ programming language). Of course, it is also necessary to develop new hardware in parallel with the aircraft's software.

As part of its System Development and Demonstration (SDD) phase that began in October 2001, the very first F-35s flew their maiden flights in 2006. From there, the flight test program conducted over 9,200 sorties and logged more than 17,000 flight hours. It also saw the aircraft complete over 1,500 vertical landing tests and perform 183 weapon separation tests. Finally, in April 2018, it executed more than 65,000 test points to receive Block 3F capability for its Operational Flight Program.

Although it took the F-35 nearly 16 and a half years and 55.5 billion US dollars to finally reach Block 3F capability, the F-35B short takeoff and vertical landing (STOVL) variant has been in service with the U.S. Marine Corps since 2015, and the conventional takeoff and landing (CTOL) F-35A has been deployed by the U.S. Air Force since 2016. At the time, the F-35B was running interim Block 2B software, and the F-35A ran Block 3i, which featured limited functionality in order to jumpstart the program in terms of Initial Operational Capability (IOC).

Block 3F has achieved considerable performance improvements; Block 2B had only AIM-120 AMRAAMs for air-to-air combat, but it is now possible to fire AIM-9X Sidewinders. In addition to the "Stealth Mode" that only stores weapons in the fuselage's weapons bay, there is also "Beast Mode," which loads additional weapons under the wings to increase its payload at the expense of stealth. The F-35A variant also features an internal cannon and increases the 7G limit up to 9G.

Since the implementation of Operational Flight Programs in fighter aircraft takes so much time, it is deployed in stages once the highest priority features have reached a certain level of functionality. If you take one of the older F-35s running on the previous OFP and update it to the latest version, its capabilities will rise to match those of F-35s produced later on.

Indeed, even Block 3F is merely another step on the road to progress. Going forward, the F-35's OFP is scheduled to be updated once every two years, adding new features with Block 4, Block 5, and so on. The U.S. military plans to deploy the F-35 until the year 2070, meaning that some F-35s will likely remain in service until the 22nd century. It is impossible to say if the F-35 will be on Block 50 one hundred years from now, but the fact remains that development on them will continue until the very last plane has been retired and scrapped.

Modern Air Combat Is Decided by Software

In the arena of air-to-air combat, the first pilot to find his or her opponent and fire a missile is almost assuredly the winner. This axiom is often described as first-look, first-shot, first-kill capability.

A plane's radar is its most important sensor for detecting enemies. However, the weakness of radar is that it can be exploited by electronic jamming devices. OFPs are responsible for managing the plane's radar systems and will attempt to avoid countermeasures through methods such as automatically changing the radar frequency once interference is detected. However, the enemy's OFP will also attempt to counteract those measures in kind. As such, radar systems and electronic jammers repeat this cycle dozens or hundreds of times per second, leading to a furious back and forth between the two systems. Naturally, the aircraft's electronic jammers are also trying to interfere with the enemy's radar, so those who can emerge victorious in this struggle will gain the opportunity to fire their missiles first.

Stealth aircraft that are hard to see on radar can also be considered a kind of electronic interference, but as OFPs improve, they will be able to detect even the slightest response from such aircraft amidst other radar noise from relatively long distances. There may be pilots that can bring out 100% of an aircraft's performance, but as long as it is impossible to make it 101%, it is safe to say that victory in air-to-air combat is mostly decided on this unseen battle between software programs. And in this respect, the F-35 is overwhelmingly superior to any other fighter aircraft in existence. The F-35 is packed with sensors. In addition to radar, it features the world's first electro-optical distributed aperture system (EO-DAS) that uses infrared sensors to provide unobstructed spherical detection of enemy aircraft instead of just in front of it. However, all of the information obtained by the sensors is managed by the OFP and only what the pilot needs is provided.

The F-35's Tactical Situation Display (TSD) is extremely similar to the one found in Ace Combat 7. In Ace Combat 7, you can accurately discern your position, as well as that of friendly and enemy aircraft, just like when displaying the map of the stage. Additionally, helmet-mounted display systems (HMDS) can display the position of enemy and friendly aircraft, which has also been faithfully reproduced in the game. This processing of tactical information by software is called "sensor fusion," but just 20 years ago, there were no fighters that possessed such a capability.

Fighter aircraft equipped with sensor fusion have an advantage even when fighting opponents within the pilot's field of vision. You can simulate the experience of fighter aircraft from before the 1990s in the Ace Combat series by turning off all of the instrument displays. You have no idea where the enemy is at any given moment, meaning that you are unable to fully utilize your aircraft's capabilities, no matter how advanced they are. Even if you manage to spot a fighter plane with twin stabilizers, it can be difficult to distinguish whether it is an enemy Su-27 or your wingman's F-15.

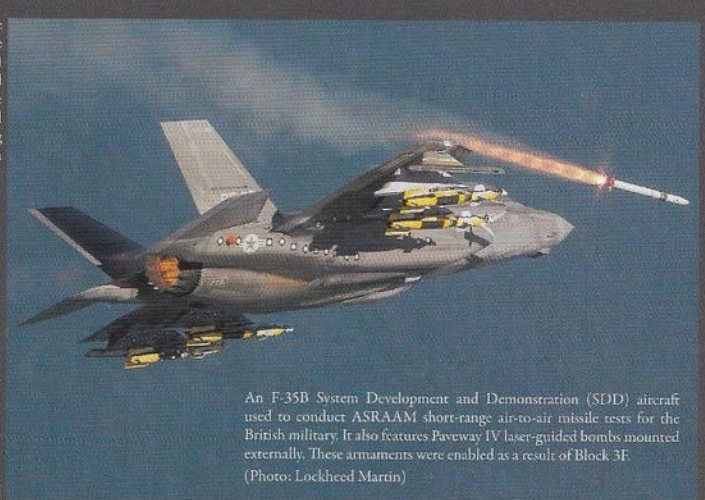
It is also possible to improve performance in existing fighter aircraft by updating their OFP. During the F-2's initial deployment stage in 2000, it served primarily as an anti-ship aircraft. Although it was an ambitious fighter aircraft equipped with the world's first AESA-type radar, it suffered from occasional losses of target lock-on and other issues. It was also equipped with the old AIM-7 Sparrow air-to-air missiles as its main armament, making it a poor choice in aerial combat.

However, as of 2019, the radar-related issues have been resolved due to updates to its OFP. Additionally, new air-to-air missiles such as the AAM-4 and AAM-5 can now be equipped, as can bombs featuring a JDAM guidance system, leading to a huge improvement in the fighter's performance. In order to expand its performance even further, it will also begin replacing its mission computer with an upgraded version that features even better information processing capabilities.

Clearly, the development of modern fighter aircraft is mainly done through software. It will not be possible to gain an advantage in battle without the use of long development times and large budgets needed to continually update the aircraft's software and further enhance the capabilities of AI systems designed to aid the pilot.

The main touch panel inside the F-35 cockpit. On the left is the Tactical Situation Display (TSD) that shows tactical information and a map centered on the aircraft. The right side shows a target captured by the Electro-Optical Targeting System (EOTS) displayed as a video image.
(Photo: Kentaro Seki)

An F-16V Block 72 variant. Due to numerous additional features introduced through the updating of its onboard electronic equipment and software, the F-16 has received so many performance improvements that the concept of it as an exclusive air superiority fighter seems like ancient history given its multirole capabilities today.
(Photo: Lockheed Martin)



An F-35B System Development and Demonstration (SDD) aircraft used to conduct ASRAAM short-range air-to-air missile tests for the British military. It also features Paveway IV laser-guided bombs mounted externally. These armaments were enabled as a result of Block 3F.
(Photo: Lockheed Martin)

X-02S Strike Wyvern

Overview	Role	Air superiority/Multirole fighter
	Crew	2 (pilot, weapon systems officer)
Development	launch	4/19/2010
	National origin	Erusea, Osea (EASA, North Osea Gründer Industries)
	Length	21.84 m
	Wingspan	18.3 m (with outer wings deployed) 11.54 m (with outer wings stowed)
	Height	4.36 m (with outer wings deployed) 3.42 m (with outer wings stowed)
Weight	Plane only	15,200 kg
Propulsion	Engines	Two GIG/ERG-3000s
	Performance	Combat radius 1,280 km
	Max speed	Mach 2.5+
Weaponry	Fixed weapons	One anti-air machine gun
		Aircraft-mounted railgun
		Dark Fire long-range air-to-air missiles (AAM)
		Star Fire next-generation anti-ship missiles (ASM)
		AIM-9X Sidewinders
		R-73 Archers - etc.
Other	Aerial refueling Either via the flying boom system or the probe-and-drogue system (selectable as an option)	

The X-02S "Strike Wyvern" is a highly modified air force fighter that was developed from the X-02A "Wyvern" air superiority fighter developed in Erusea for both naval and air force use.

When first deployed, the X-02A used a combination of stealth technology and Dark Fire anti-air missiles to outrange opponents and dominate the sky, but soon other nations began to push back by employing stealth squadrons and denser jamming environments, allowing them to weave through the initial volley and engage in dogfights. Its variable forward-swept wings served it well in close encounters, but structural fatigue created cracks and folds that led to mechanical failure.

With few compatible anti-surface weapons and a short flight range, it did not have enough flexibility for practical use. North Osea Gründer Industries set out to improve the airframe and solve these problems.

The project began with an overhaul of the airframe, and the manufacturing for most parts was switched to metal 3D printers. This allowed the aircraft to carry more equipment while still being lighter than the X-02A. Its improved engines made great use of heat-resistant magnesium alloys, significantly enhancing both thrust and fuel efficiency. Saw-tooth exhaust nozzles made the plane quieter and lowered its infrared signature. Air intakes were expanded and adjusted to compensate for greater thrust. Additionally, the shapes of the weapon bays were altered, and conformal fuel tanks were added to the top.

The latest electronics warfare devices were also installed, and the control system ensured redundancy by using both fly-by-wire and power-by-wire.

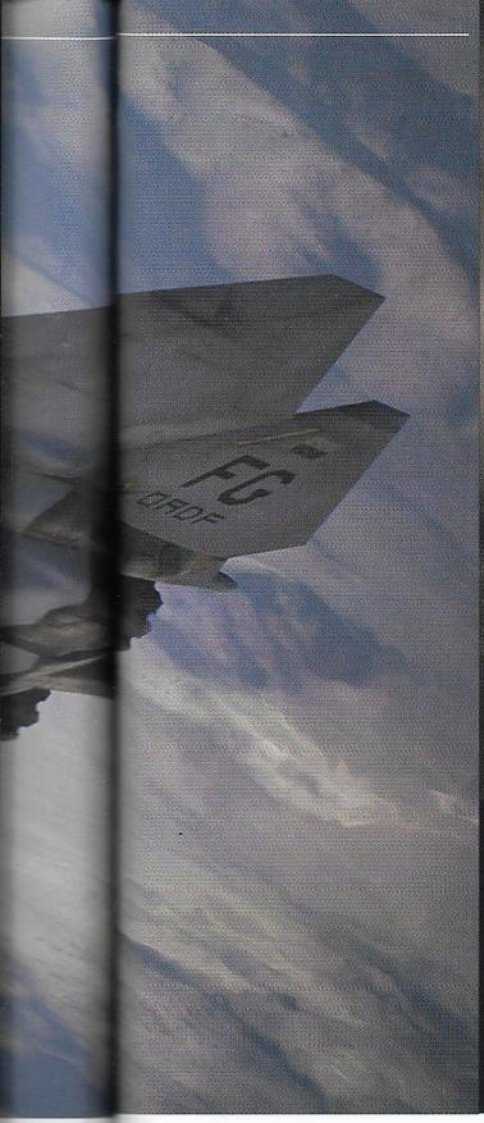
Control programs were updated, allowing full use of the newly added folding canards, variable forward-swept wings, V-shaped tail, and 3D thrust vectoring, giving the aircraft unparalleled maneuverability. The ventral fins were removed after being deemed unnecessary.

The aircraft's arsenal was expanded to include improved Dark Fire anti-air missiles (AAM) and Star Fire anti-ship missiles (ASM). The latter includes an integrated solid rocket/ramjet propulsion system that lets it strike ships at speeds in excess of Mach 3. Aircrews have nicknamed the missile "Flipper" due to its distinctive shape.

For fixed weaponry, the aircraft continues to have a machine gun equipped on the left side of the nose. A large foldout Arclight electromagnetic railgun was installed next, which is perhaps the plane's most unique feature. This revolutionary weapon can send high-speed rounds to targets at any distance away, making the aircraft into a flying sniper. The cockpit was expanded to accommodate a weapons officer who operates these systems, splitting the workload.

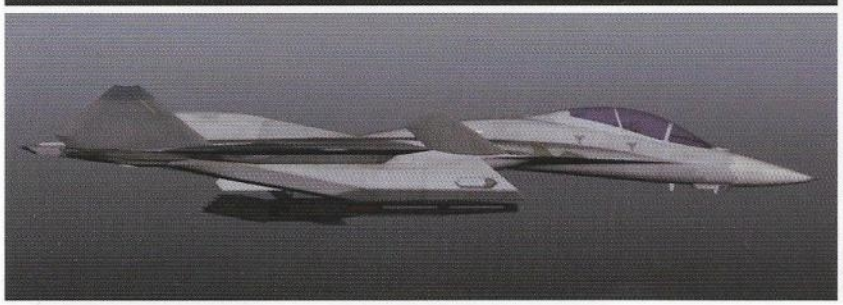
While the X-02S looks fairly similar to its predecessor, underneath it has evolved into a completely different machine.

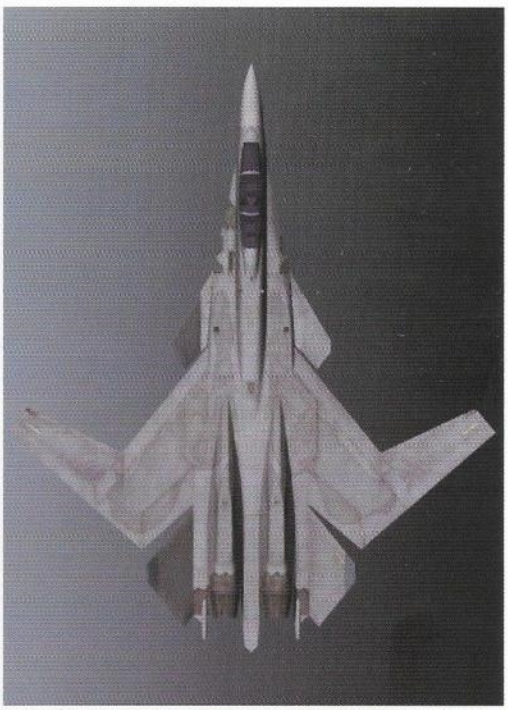
Although its characteristic variable wings give it both superb speed and combat capabilities while carrying a heavier armament, making it a top-class aircraft, only the finest pilots will be able to squeeze the most from its delicate controls.

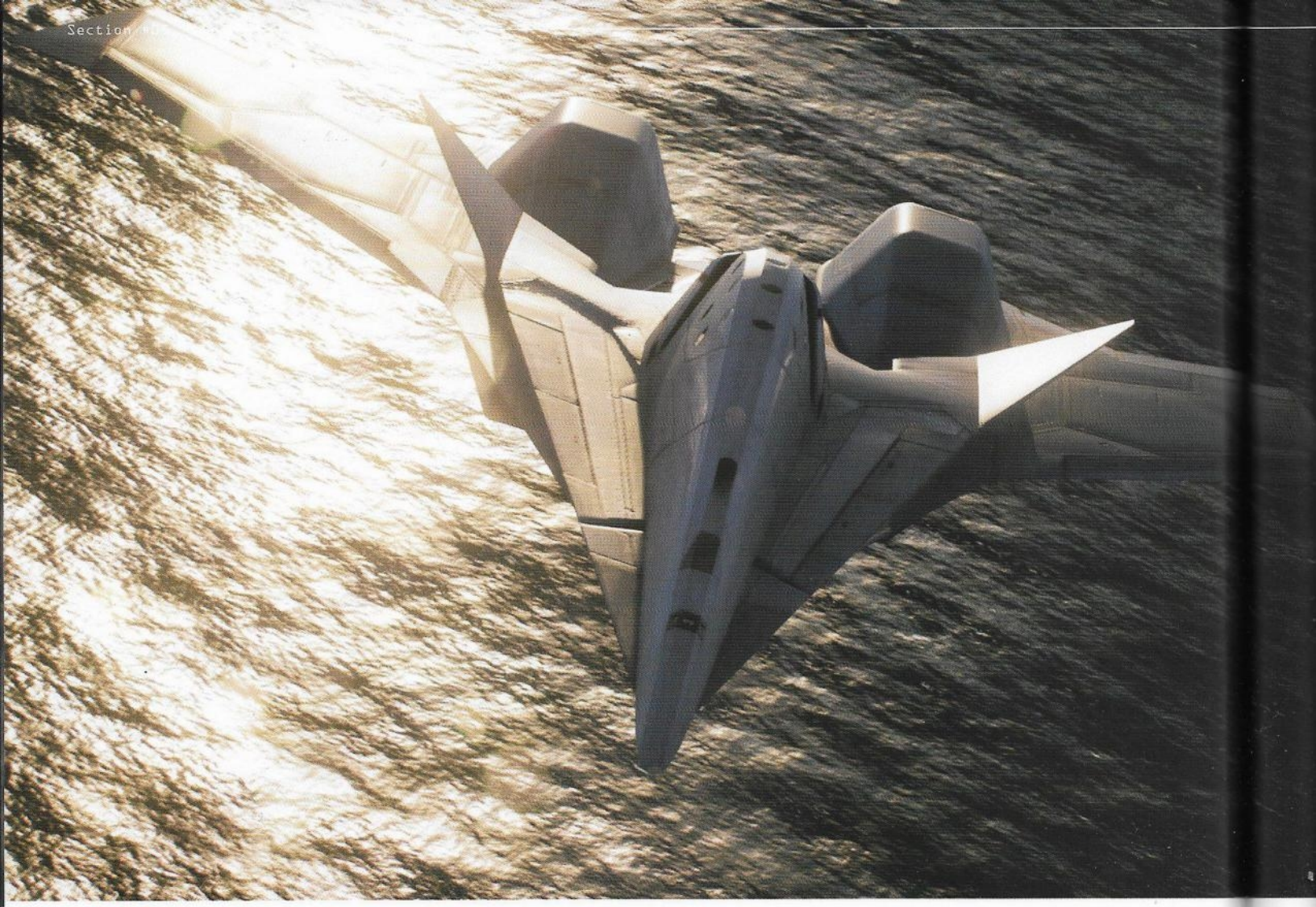


When Erusea changed from a republic to a kingdom, its military went through a restructuring that amounted to a dismantlement. The EASA was maintained for the purposes of national defense and the acquisition of foreign currency.

This aircraft was tested at an EASA research center in central Usea, but this was for the purpose of teaching AI the skills and judgment to pilot, as well as maintaining Erusea's ability to independently develop aircraft. The development of the X-02S was continued in secret by the EASA with the goal of creating a nearly invincible, highly agile aircraft capable of stealth supercruising and armed with a large railgun.







ADF-11F Raven Raven

A large fighter by North Osea Gründer Industries. When developing the seventh-generation aircraft for the ADF series, the Erusean Air and Space Administration (EASA) defined the concept as "the ultimate in survivability," and two aircraft models were planned: an autonomous mother drone and a manned aircraft. This is regarding the manned model.

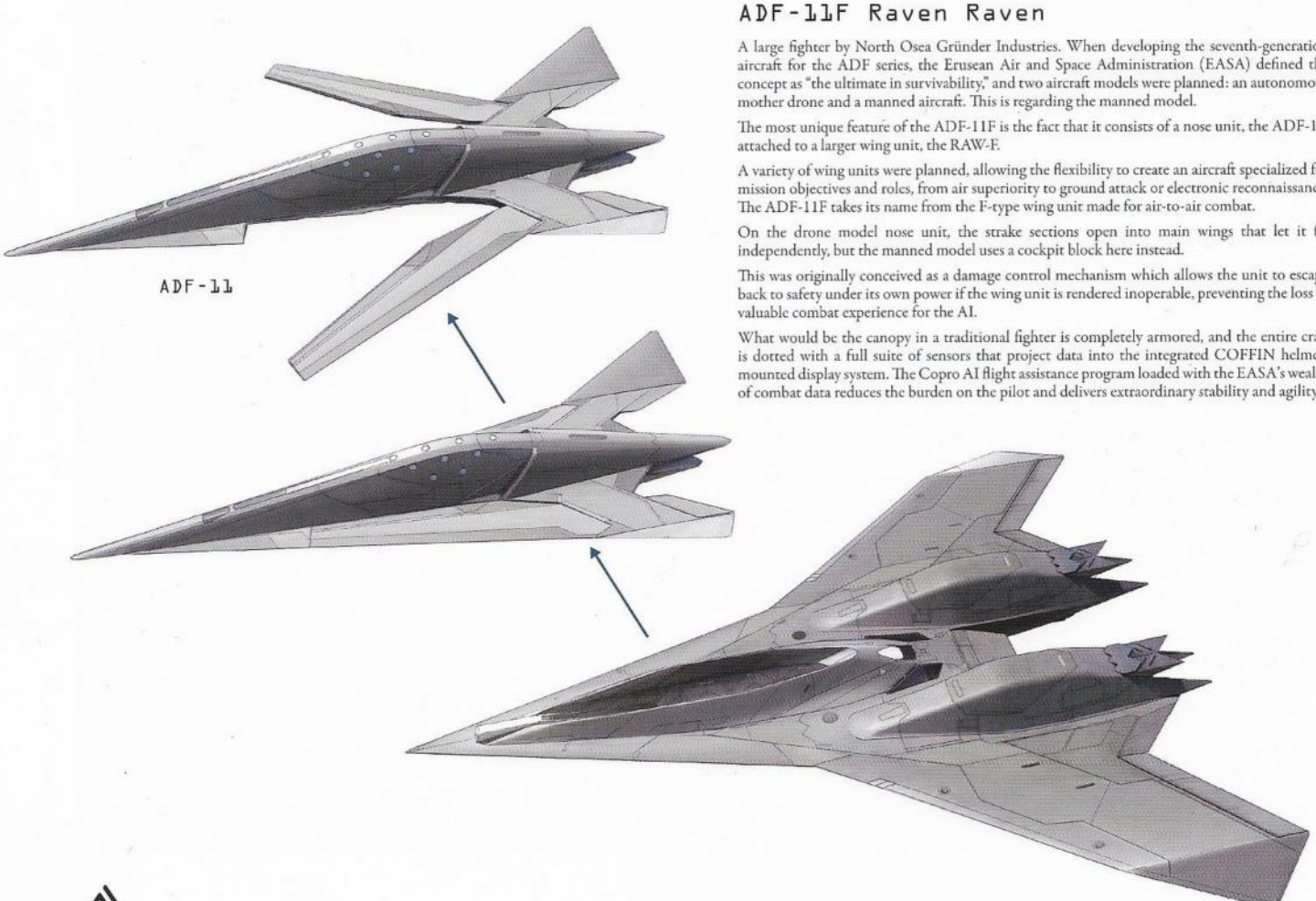
The most unique feature of the ADF-11F is the fact that it consists of a nose unit, the ADF-11, attached to a larger wing unit, the RAW-F.

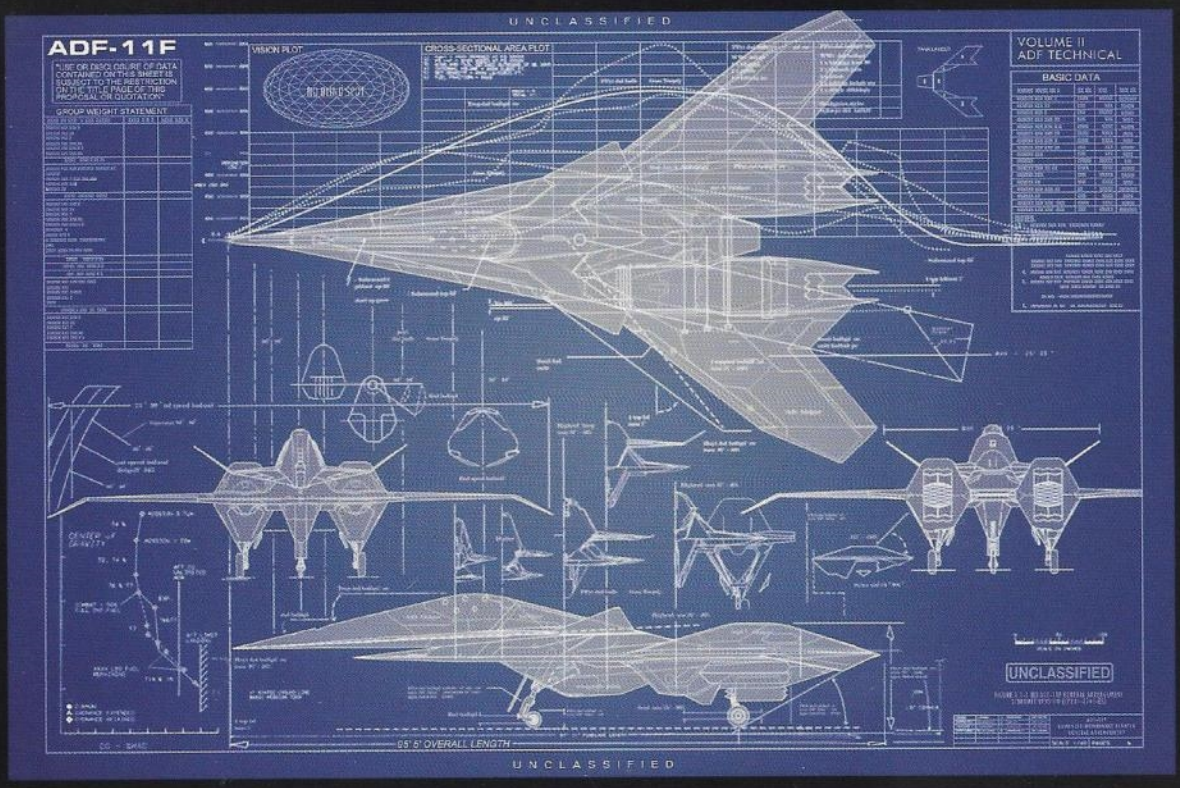
A variety of wing units were planned, allowing the flexibility to create an aircraft specialized for mission objectives and roles, from air superiority to ground attack or electronic reconnaissance. The ADF-11F takes its name from the F-type wing unit made for air-to-air combat.

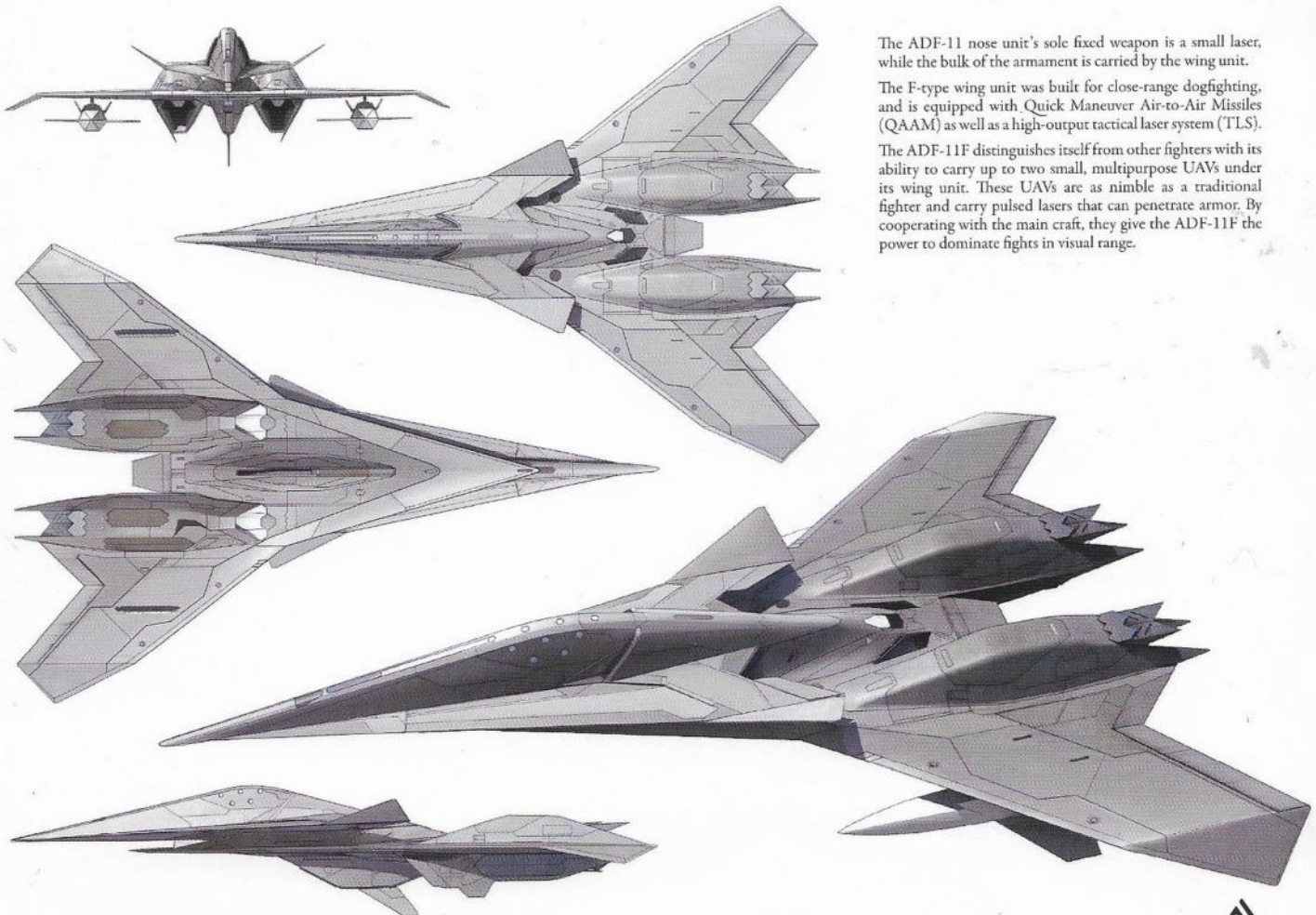
On the drone model nose unit, the strake sections open into main wings that let it fly independently, but the manned model uses a cockpit block here instead.

This was originally conceived as a damage control mechanism which allows the unit to escape back to safety under its own power if the wing unit is rendered inoperable, preventing the loss of valuable combat experience for the AI.

What would be the canopy in a traditional fighter is completely armored, and the entire craft is dotted with a full suite of sensors that project data into the integrated COFFIN helmet-mounted display system. The Copro AI flight assistance program loaded with the EASA's wealth of combat data reduces the burden on the pilot and delivers extraordinary stability and agility.



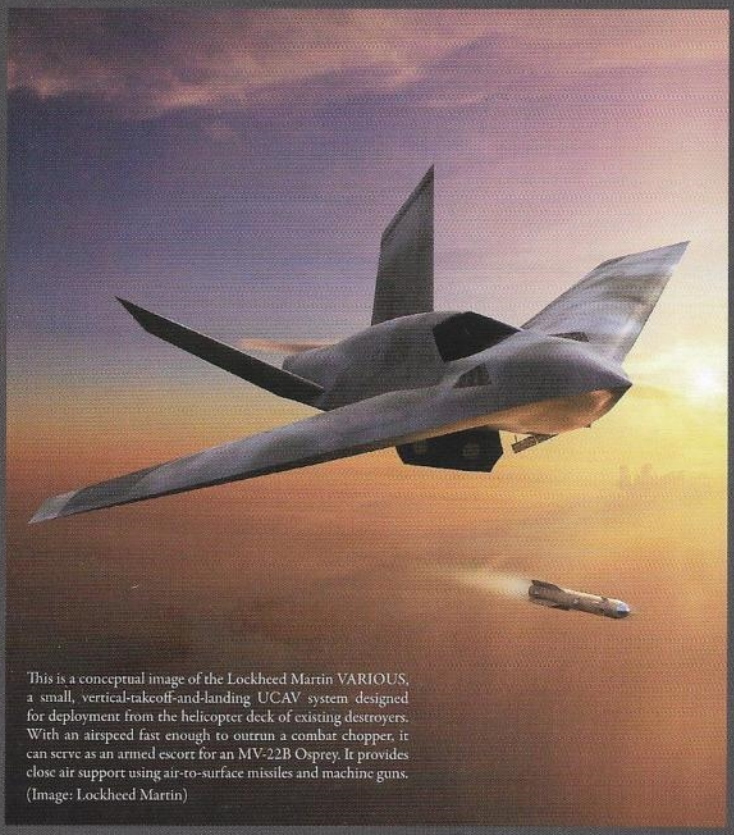




The ADF-11 nose unit's sole fixed weapon is a small laser, while the bulk of the armament is carried by the wing unit.

The F-type wing unit was built for close-range dogfighting, and is equipped with Quick Maneuver Air-to-Air Missiles (QAAM) as well as a high-output tactical laser system (TLS).

The ADF-11F distinguishes itself from other fighters with its ability to carry up to two small, multipurpose UAVs under its wing unit. These UAVs are as nimble as a traditional fighter and carry pulsed lasers that can penetrate armor. By cooperating with the main craft, they give the ADF-11F the power to dominate fights in visual range.



This is a conceptual image of the Lockheed Martin VARIOUS, a small, vertical-takeoff-and-landing UCAV system designed for deployment from the helicopter deck of existing destroyers. With an airspeed fast enough to outrun a combat chopper, it can serve as an armed escort for an MV-22B Osprey. It provides close air support using air-to-surface missiles and machine guns. (Image: Lockheed Martin)

Article: From Drones to Unmanned Aerial Vehicles

The Future of Fighter Planes: Will UAVs Exceed the Capabilities of Manned Aircraft?

The showdown between manned and unmanned fighters begins

Manned versus unmanned fighters is a major theme in Ace Combat 7. Unmanned aerial vehicles (UAV) and drones are rapidly making inroads in society. They vary in price from several hundreds of dollars for inexpensive drones for personal use to more than 100 million US dollars for UAVs such as the RQ-4 Global Hawk. I have written more than my fair share of articles on unmanned fighters, but as of 2019, I have yet to come across one that rivals the overall capabilities of their manned brethren. While there are UAVs based on fighter plane designs, they are merely used as aerial targets. As such, are battles between manned and unmanned aircraft still something yet to come well into the distant future?

The answer is no. They have already taken place, and not just in video games. In fact, I can present verifiable cases as proof. One such case occurred in the skies 200 km west-southwest of Baghdad on December 23, 2002, right before the Iraq War broke out. An Iraqi Air Force MiG-25PDS Foxbat fighter locked on to a U.S. Air Force MQ-1B Predator UAV and fired two air-to-air missiles (believed to be either R-40s or R-60s) at it head-on, blasting it out of the sky.

In actuality, manned fighters shooting down UAVs is not all that uncommon. The most large-scale and well-known cases consist of the Royal Air Force downing Fi103 flying bombs (V-1) during World War II. The Fi103, however, did not have air combat capabilities. The MQ-1B, on the other hand, was armed with two FIM-92 Stinger air-to-air missiles, and it had launched one before it was downed. The FIM-92 missile failed to hit its target, but the fact that the MiG-25PDS and MQ-1B fired on each other qualifies the encounter as a dogfight—one in which the MiG emerged victorious.

That the history of combat between manned and unmanned aircraft began in Mesopotamia, the cradle of civilization, feels like more than a coincidence to me. But suffice to say, the first page of that history book will forever tell how the manned aircraft won the very first battle.

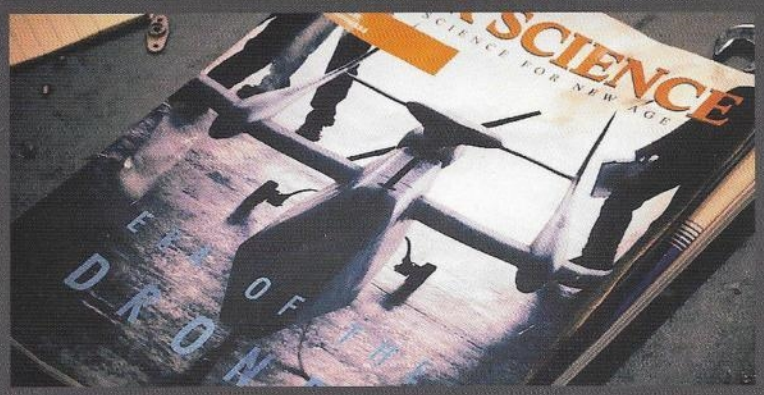
Possibilities of Unmanned Fighters as Suggested in Ace Combat 7

UAVs whose primary role is to directly engage in combat are known as unmanned combat aerial vehicles (UCAV), and these UCAVs along with their ground-based control stations are collectively known as unmanned combat air systems (UCAS). Since there is no clear demarcation between UAVs and UCAVs, the MQ-1B UAV, with its air-to-ground and air-to-air attack capabilities, can also be considered a type of UCAV.

Although the MQ-1B engaged in a dogfight by firing an air-to-air missile, its single engine gives it a maximum air speed of 200 km/h, rendering it incapable of air combat maneuvers. Furthermore, the absence of anti-air radar means it lacks the features demanded of a modern fighter plane, relegating it to nothing more than an attack or surveillance aircraft. As such, the first dogfight by a UAV was nothing more than an act of self-defense after the MiG-25PDS locked on.

If we take the strict definition of a fighter plane as "an aerial vehicle that attains air superiority through the maneuverability necessary to pursue other aircraft and the weaponry capable of downing them," there are no UCAVs that yet fit that description. However, there are individuals similar to Schroeder and Mihaly around the world who are devoted to the development of UCAVs. Among the UCAVs they have developed, there would no doubt be some that we can confidently label as UCAVs in the strict sense.

The first stage of practical UCAVs is considered to be a robot wingman. In 2013, the Air & Space Power Journal published by the U.S. Air Force's Air University included a feature article about a UCAV concept known as the F-40 Warhawk II, which was supposed to become feasible in the 2020s. In a nutshell, the F-40 described therein is like the MQ-101s carried by the Arsenal Bird. However, the F-40 takes off from the ground, and while its maneuverability is subject to the same 7G limit as current fighter planes, it is otherwise extremely similar in concept.



> As such, there is no loss of human life (at least on their side), no matter how many are downed. And that right there is the foremost feature of a UAV, because of all the elements comprising a fighter plane, its pilot is the most valuable.

You might have felt a tinge of fear vis-à-vis the in-game MQ-101s. I found the scene where the Arsenal Bird drops a swarm of them that proceed to attack en masse quite hair-raising and extremely thrilling. The advantages of the F-40 also lie therein. It does not carry any radar itself, which means it cannot fight on its own. Its AIM-120D AMRAAM air-to-air missiles and SDB guided bombs are aimed via a network that makes the most of joint combat capabilities. The ultimate objective is to keep the cost-per-unit down by simplifying the onboard electronics (avionics) and the fuselage itself, thereby enabling mass production and procurement.

The F-40 is a subsonic aircraft, and four to six of them are designed to accompany a manned "master" fighter plane. They fly autonomously by means of artificial intelligence (AI) incorporating a flocking control algorithm, and during combat, they press the enemy with superior numbers. The simple, low-cost F-40 may be weak compared to manned fighters, but if 12 simultaneously attack two enemy planes, they have a good chance of winning. Even with numerical superiority, the F-40s will likely suffer a higher kill rate than the enemy, but they do not have pilots onboard. As such, there is no loss of human life (at least on their side), no matter how many are downed. And that right there is the foremost feature of a UAV, because of all the elements comprising a fighter plane, its pilot is the most valuable.

Training a single fighter pilot takes some 20 years, going all the way back to elementary school. The cost of operating a fighter plane is almost the same as procuring it, but that is primarily a factor of how expensive it is to train its pilot. F-40s have an operating cost approaching zero because they do not need to be flown regularly. Only the minimum necessary need to be maintained, and the rest can be mothballed. Even if there were a version with the cost and performance equivalent to a manned fighter, it would still be far cheaper, and the fact that you would never lose a pilot is absolutely priceless.

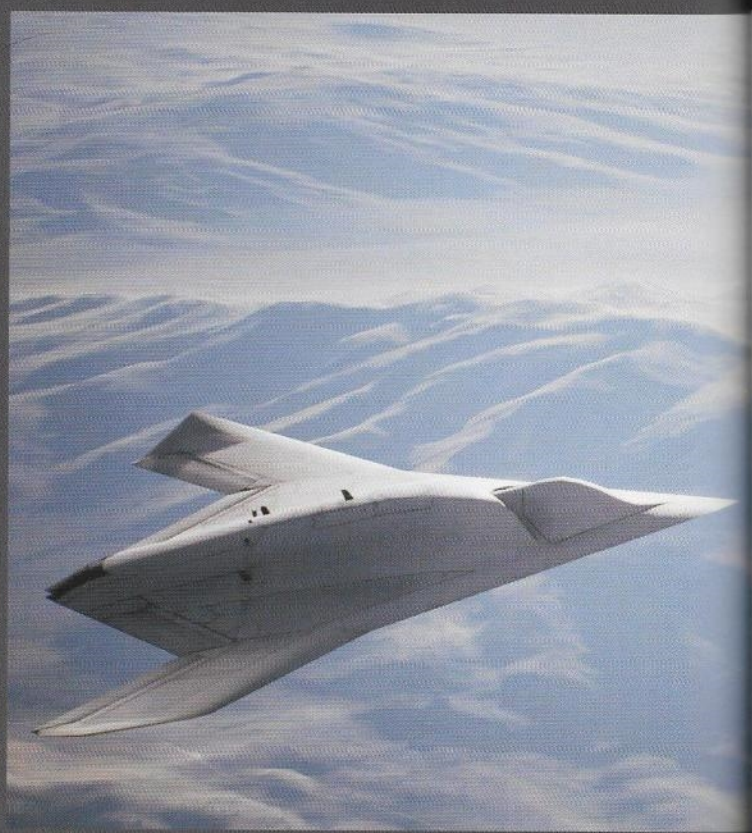
Jack Bartlett, a character from Ace Combat 5, had this to say about the high value of combat pilots:

"We can replace these things, it's gettin' the crew back alive that counts. Make a call to scramble the search and rescue copter and my reserve plane, okay?" We can broadly interpret this to mean that UCAVs cannot lose.

The sort of combat method that takes advantage of the low cost unique to UAVs is known as swarming, and it has the potential to profoundly transform the future of air combat. The true significance of swarming lies in the extreme difficulty in countering it. It is simple and inexpensive, and the effect scales with the more UAVs you have. Self-destructing UAVs are particularly optimal.

Let's say, for example, that a certain country was bent on neutralizing the Japan Air Self-Defense Force with conventional warfare alone. It would certainly be quite difficult to destroy Japan's air defense network, which consists of 300 fighter planes, 28 radar sites, 17 airborne warning and control system aircraft, and 7 Aegis warships, among other assets. However, if the aggressor were to precede the attack with a secret shipboard launch of a swarm of 1,000 self-destructing UAVs costing approximately $1,000 US dollars a piece, the Self-Defense Force would be helpless.

Japan could defend against such an attack by placing its fighter planes in reinforced concrete bunkers ahead of time, but as of 2019, the Japan Air Self-Defense Force only has enough bunkers for some 60 planes, which would leave the rest utterly defenseless. Even the most durable fighters would be rendered unflyable if an UAV packing the explosive power of a mere hand grenade were to explode within 10 meters. In short, a few dozen covert operatives with about $10 million US dollars worth of UAVs and ships could destroy up to 200 fighter planes, each worth about $100 million.



AI must be capable of humanlike emotional responses bef UCAV

Article: From Drones to Unmanned Aerial Vehicles

The Future of Fighter Planes: Will UAVs Exceed the Capabilities of Manned Aircraft?

Will "killer robots" ever be acceptable?

The merits of sparing lives are not limited to economics and swarm tactics. Combat pilots are military personnel, but more importantly, they are citizens of their country. In Japan, its people are sovereign members of the nation, with the national government existing for their sake, and the nation's official stance can be summed up as "The life of one person outweighs the earth." While there may be some conceptual differences, other democratic nations also broadly recognize that life and human rights must be protected to the greatest extent possible.

There is no government without a military, and so long as military conflicts are waged for achieving a national objective, whether it be an anti-terror operation, a territorial dispute, or purely defensive, the merits of not inviting the wrath of the nation's people by putting their lives at risk are far greater than any economic merits.

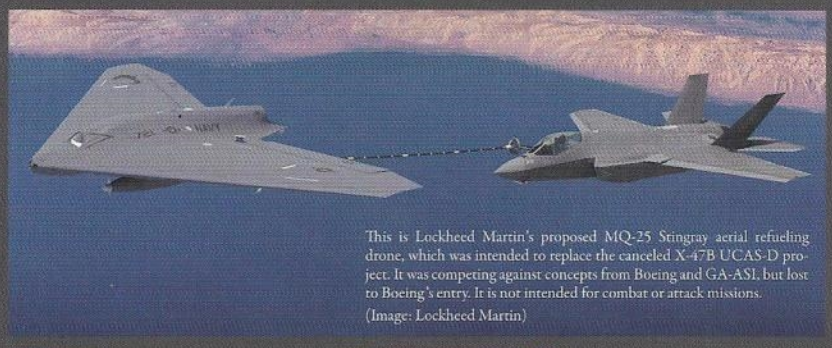
This is also a problem that arises from not being able to lose a life. It has mostly to do with ethics, and the term "killer robot" puts in stark perspective the abhorrence of a UAV killing a human. That said, the MQ-1B and other UAVs with the capacity to carry missiles and other weapons do not have AI capable of autonomously determining strike targets at this time. They all have remote pilots with their finger on the trigger, which means a human's judgment is behind every shot fired. As such, the attack procedure is no different than from a manned aircraft's. The aforementioned dogfight with the MiG-25 also took place with a pilot issuing the fire command from a ground-based control station. However, that is not how it works with UCAVs, because in a real dogfight, there is no time to issue fire commands from afar.

UAV communication is broadly classified as either line of sight (LOS) or satellite communication (SATCOM). With LOS communication, the control station and UAV directly exchange radio transmissions. Time lag is minimal, but it will not work if there are any physical obstacles between them, including the earth's curvature, which prevents operations beyond the horizon. The physical limit at an altitude of 5,000 m would be a distance of 268 km to the horizon.

On the other hand, SATCOM, as the name suggests, establishes a communication link via satellite, so there is no range limit. As such, this mode of communication is essential to UAVs that fly beyond a certain range. SATCOM, however, has a large time lag of two seconds each way. This brings to mind a foreign correspondent on the other side of the world trying to speak with an in-studio newscaster. The communications delay makes the result painful to watch. The same thing happens between a UAV and its control station. Plainly, it would be impossible to play Ace Combat with a four-second control delay. Furthermore, the MQ-1B has a connection speed of 1.6 megabits per second, which is not even enough to receive DVD-quality video in real time.

Because of this, UCAVs must not be allowed to perform tactical operations, including firing weapons, based on AI judgment. Of course, the idea of an AI sparking a war on its own is nothing more than a bad dream, and it would be inconceivable to let it freely use missiles and bombs costing several hundreds of thousands to several millions of dollars and paid for with precious taxpayer money. As such, an officer is required to command UCAV operation. And that is why a robot wingman is considered to be the first stage of practical UCAVs.

A good example of this would be the pilot of a manned fighter making a target list and transmitting a destroy command before the UCAV is allowed to enter autonomous combat mode. In this case, the time lag can be ignored because line-of-sight communication is used. Conversely, if the manned fighter is a stealth plane, radar targeting can be left to the UCAV because there is a risk of detection, and the manned fighter can then use missiles or other weaponry based on that radar information. This is an example of UCAV acting as a partner or wingman for the manned fighter.



This is Lockheed Martin's proposed MQ-25 Stingray aerial refueling drone, which was intended to replace the canceled X-47B UCAS-D project. It was competing against concepts from Boeing and GA-ASI, but lost to Boeing's entry. It is not intended for combat or attack missions. (Image: Lockheed Martin)

es befo UCAV will be allowed to autonomously conduct missions

AI Is Key

The F-35 is a manned fighter, but the plane's AI has full authority over the flight control system. As such, manual flight control by the pilot is not allowed. Although there is a control stick on the right side of the cockpit, it is nothing more than an input device for the AI. It is basically just a glorified game controller.

The AI also performs all information collection using the plane's radar, infrared sensors, and data network. There is no need for the pilot to operate the onboard electronics. One could say the F-35 is about as functionally equivalent to a UCAV as a manned fighter can be. So why did the F-35 never evolve into a full-fledged UCAV? The reason lies in the unique differences between humans and AI. Current AI is better than humans at collecting information and repeatedly executing simple, preprogrammed tasks, but it falls woefully short of the human ability to make judgments and decisions based on such information.

AI will only flip the master-slave paradigm once it is able to make humanlike judgments and decisions. Until then, it will be relegated to robot wingman status. Since fighter planes have been nearly perfected in terms of their use as a weapon, their evolution from manned control to fully automated control capable of carrying out operations hinges entirely on AI.

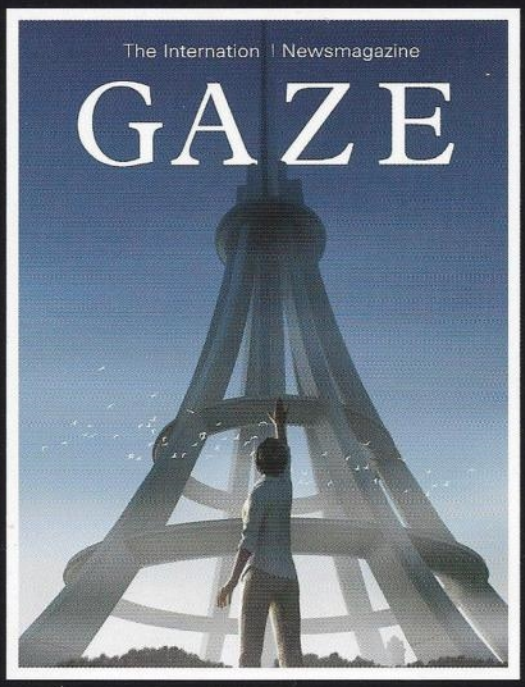
In recent years, there has been a great deal of attention focused on deep learning, in which a computer uses an AI neural network to replicate the human brain's ability to process information and thereby learn. Until a few years ago, the prevailing view was that humans would maintain their superiority in Go, a game with a seemingly endless number of patterns, but through deep learning, AI has proven that wrong. In addition, it can now perform nearly flawless character recognition, while image recognition, voice recognition, and machine translation all continue to improve in terms of their precision. In the not-too-distant future, we will almost certainly see deep-learning-powered AI on fighter planes that surpasses human capabilities. But beyond that point, things may get difficult.

Even today, AI powered by deep learning can look at an image and detect a long tail, large eyes and ears, a roundish body, and soft fur, and based on those features, decide that it is seeing a cat. However, it is not at the next level where it can understand the emotional response humans have when they see a cat, such as it thinking it is cute or fluffy looking. AI must be able to think that a cat is cute before it will ever be able to make correct decisions.

For instance, let's say that during an operation, a command was issued to destroy a training facility. The AI evaluates images from the forward-looking infrared system, thereby detecting the target structure, determining there is a high probability that it is a training facility, detecting multiple human figures in the area, deciding that there is a low risk of unintended deaths if guided bombs are used, and finally deciding to execute the attack. However, if a human pilot had looked at the same image, he would have noticed that the human figures around the target structure were boys and girls in school uniforms and that the open area was a sports ground. That would have led to the realization that the structure was probably a school and that the attack should be called off. Advanced judgment that includes such deductions is a skill learned via social norms and common sense attained through experience over a period of at least 20 years. But such a decision cannot be reached if the emotional feeling of not wanting to kill children is lacking.

It is ironic how AI must be capable of humanlike emotional responses before a UCAV will be allowed to autonomously conduct missions that may result in human casualties. Of course, over the course of the countless wars waged throughout human history, people have not always made the best possible decisions, and we can probably expect the same once AI begins thinking and acting like a human.

"Soon no one will know what it feels like to grip a control stick and take to the skies." Fighter pilot may very well be the last job that can be replaced by AI. I still can't write an article that states it as well as the magazine that Avril's grandfather tossed over to her. But now that we've entered an age where AI can improve itself and is advancing at breakneck speed, military analysts believe that the future wherein AI has become humanlike will be different from what we expect it to be today.



The International Newsmagazine GAZE Extra Edition

Special Feature

The End of the Lighthouse War

In December of 2019, a ceasefire between Osea and Erusea was signed at an Expo City conference. With a mutual nonaggression pact to be signed next month in the neutral country of North Point, the war is finally coming to a close. However, a satisfactory peace for the continent remains distant. Parts of Erusea cry out for independence, and the nationalist Free Erusea faction has resurged in the north.

Because of this, there are plans for a large-scale reorganization and redeployment of the International Union Peacekeeping Force largely comprised of Osean soldiers across all areas of the Usean continent.

The turbulence continues, but people are beginning to gather at the lighthouse.

Girls Carrying Relief Goods

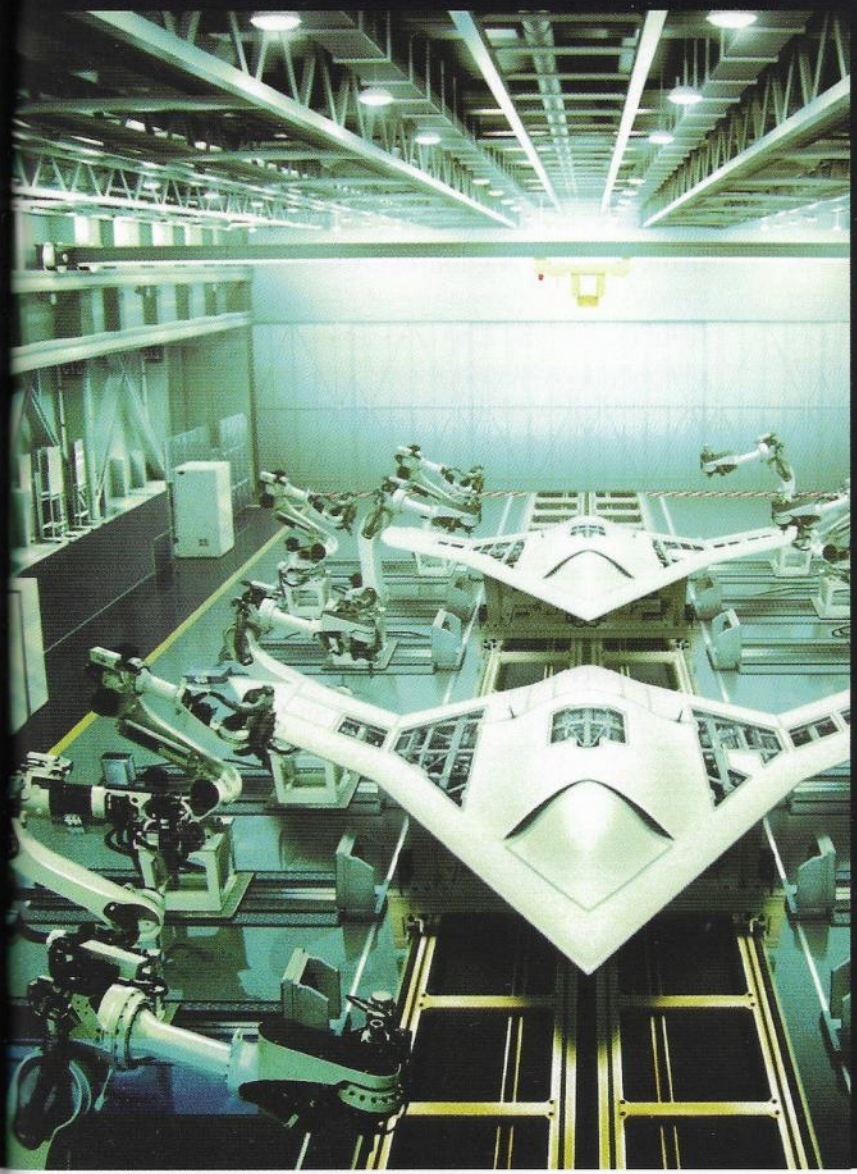
Supplies are always scarce at a refugee camp built in a former war zone where the smell of gunpowder still clings to everything. Even so, beautifully ordinary smiles bloom on the faces of those living here. This is thanks in part to a leader who aims to create a more cosmopolitan world.

Refugees Assemble at the Space Elevator

A lonely bridge connects Selatapura to the space elevator. Atop it are a string of vehicles occupied by people displaced by the war. An expansive refugee camp has been built around the roots of the elevator, and people from all over Usea have gathered here.

Erusean Drones Launch from the Cover of Containers

As the war broke out, there was a frantic search throughout Osea for cargo containers from the Erusean Army. Surprise attacks by Erusean drones hidden in containers struck and crippled every aircraft carrier anchored at Port Bana, Port Saint Hewlett, and other major naval stations. However, perhaps because Erusea was so confident that this initial wave would be successful, Osea's six-week search was largely fruitless.



Erusea's Quest for the Perfect Drone

The Kingdom of Erusea (formerly the Federal Republic of Erusea) was defeated in the Continental War in 2004.

At the time they had considerable military might in the Aegir fleet, which was deemed invincible, and had developed variable-wing stealth aircraft, but most of this technology was lost in the war. While the Erusean Army was dismantled after the war, they maintained "a minimal organization for the purposes of self defense." In addition, significant sums were budgeted toward research into unmanned weaponry in the name of international cooperation. Thus, the Erusean Army lived on in a different shape.

The Late Vincent Harling

Construction of the space elevator followed the path of the former 48th President of the Osean Federation, Vincent Harling. His other accomplishments include ending the Circum-Pacific War and establishing peace with Yuktobania. After serving his presidential term, he took on an advisory role at the International Space Elevator Corporation. He traveled from country to country, and his talent for diplomacy earned the agreement of multiple nations for the project.

Nothing in this city bears the scent of a "kingdom."
I'm speaking, of course, of the Farbanti that I know.
We were born in the middle of a war, and I've been told it was horrible. There were all sorts of shortages, plus constant hunger, blackouts, and air raids. I vaguely recall the shortages, but the war itself came before we were aware of much, so I don't know about it, let alone the bit of star that fell from the sky and wiped out the old city four years before the war even started. As far as we were concerned, it was a far-off tale of a land that had nothing to do with us.

Nothing where we live bears the scent of a kingdom, yet it is the Kingdom of Erusea.
The Kingdom lost a war and became the Federal Republic of Erusea, then the meteor fell and another war started, we were born, and the Federal Republic fell. Then it became the Kingdom of Erusea once again.
To our generation, the Federal Republic lies on the other side of a foggy valley of memory. By the time we were going to school and starting to learn about the world and society, the country was already a kingdom ruled by a king.
At that age, everyone's idea of a king is based on picture books they saw as kids: a glittering gold crown on his head, a proud mustache beneath his nose, a cape lined with fur over his shoulders, that sort of thing. Sitting on a high-backed throne inside of a castle. A bit of a paunch. Prosperous, you know?
So when I started going to school and saw the real king on TV for the first time, I was surprised. After all, he was a slim man wearing a suit like an ordinary businessman. He had a mustache, but it wasn't anything unusual. It was the sort of mustache you might see on a clerk or a banker. The one difference was that there was a lone white rose on the breast of his jacket. With that sort of image, you can understand why I couldn't believe the kingdom I lived in was the same as the kingdoms I saw in picture books.

'The rose is the symbol of the Kingdom of Erusea.'
That's what I learned from my primary school teacher when I started going there. So the king wearing a rose on his chest made sense to me. I guess the flag we saw every day had a rose on it too. The color around the flower was pink, and the white flower in the middle was the same as the one on the king's jacket.
When I said I wanted a rose like that, Lucile, the girl who sat next to me, spoke up.
"We have lots of them at my house."
"Is your dad the king or something?"
She shook her head.
Her father was a florist.
Whenever the king came on TV in his business suit with the rose, my grandma would say, "The old king was a bit more handsome."

She was referring to the king before the Federal Republic. But she was talking to my mom, who didn't seem to really understand, which was only natural. It was from before she could remember.
When the Kingdom of Erusea looked like it was about to lose the war, there was a revolution that turned it into the Federal Republic of Erusea, which started a new war that it lost, making it the Kingdom of Erusea once again. Kingdom or republic, which is less likely to get involved in war? That's a question I cannot answer.

After a while, the face of the king on TV changed. That meant we had a new king. The king in the business suit had gotten sick and passed away. He didn't have any children to call princes or princesses, but he did have a younger brother, and so he became the second king that I knew.
This newly crowned king was another ordinary man in a suit. By that time, I was aware that kings didn't necessarily appear as they did in picture books. My grandma told me, "A tailored suit like that costs a lot of money," but I couldn't see anything special about it.
In the past, the Kingdom of Erusea was quite aggressive. Outside nations pressured Erusea to become a republic, and the king abdicated at the request of the people. Many years passed, and the children of the former king lived and died in a republic where no one could be king, and eventually it became the time of his grandchildren. When the Federal Republic of Erusea used the meteor's fall as an excuse to wage war again and lost, and the people decided they might be better off under a king after all, those grandchildren were living as ordinary citizens. The first king I knew and the brother that succeeded him were in fact simple businessmen. When the kingdom was restored, they were snatched from their lives, called the royal family, and put on TV.

The second king had a lot of children, so my grandmother said there was no need to worry about an heir this time.
The children of a king... I wonder what it'd be like to be a king's child.

I finished primary school and entered lower secondary school. When I talked about the kings and their suits and what my grandma had said about them, the student sitting next to me said, "We have suits like that at our house."

I thought about asking, "Is your dad the king or something?" but my classmate's dad wasn't a florist. So what was he?
Wait, I know.
"That must mean your father is a tailor," I ventured.

Right on the nose. The world is a very simple place.
The girl introduced herself. "Call me Rosie," she said.

She liked movies from Osea, so she wanted a name that sounded Osean. Then she told me that her father really did make suits for the king.
"Wow, that's pretty cool, Rosie. Is your dad the best tailor in Farbanti, then?"
"Maybe not the best," she answered.
She was a modest girl.

Later on, I saw Rosie's father, but only once.
All of us—about six people, I think—went to a theater downtown to watch an Osean movie Rosie had suggested. I began to see what she found so appealing, and the film began to cast its spell over me. It seemed to be working on the others too.
After the credits rolled, still entranced by the movie's magic, we decided to go to Rosie's house to talk for a while, since hers was the closest.
The street it was on still had the atmosphere of the country before the meteor fell, and the place did in fact fit the image of an old-fashioned tailor shop. The building had living space on the second and higher floors, while the shop was on the first floor. Rosie's father was at work when we entered. I wondered if he was the best tailor in Farbanti when I said hello, but his face was average enough.
However, when that face turned to stare back at the cloth, it remained fixed. He was a real craftsman. That fabric must have been pretty expensive.
The room had a vase full of pink roses. Outside the window was a flower bed with many more of the same. They weren't royalty after all. Their roses weren't white.
The only other thing that stood out in the shop was a large dog sleeping on the floor.
"There's no one else working here?" I asked Rosie.
"Not today. It's a special order, so my dad's working on his own right now."
"Oh, we shouldn't disturb him, then."
So we decided not to go upstairs to Rosie's room and went to a park instead. The dog came along with us.

The Memorial Peace Park was pretty close.
The best spot was a gazebo by the fountain.
But it was already taken when we got there. Nearby was a group of airmen in workout clothes teaching a secondary school football team. The students had taken the gazebo as a place to put their stuff. There was a mountain of duffel bags.
"This isn't going to work."
"Let's try over there."
So we set off for the second best place in the park: benches in the shade of some trees.
We began talking about the movie, and it was pleasant at first, but then a girl named Mathilde said,
"When you see the freedom they have in Osea in a film like that, it really points out the contradictions in our society."

SHORT STORY
"ROSE"

Then Lucile, the florist's daughter, replied, "I don't agree with that."

Lucile's older brother was killed in the previous war, and her mother was wounded and lost her job. She said that left her feeling bitter toward the Erusean army, but Osea had an army of their own, so they weren't any better.

The discussion got more and more complicated after that. Giselle loved to argue, so she poured more fuel on the fire.

Trying to define Osea is just holding up a mirror. What we see is no more than a reflection of the land we live in. Erusea. We all lived in its capital, Farbanti, and went to the same school, but the fact is, our viewpoints were all slightly different. My own family has an Erusean name, but my grandfather's generation were immigrants from Shilage.

As I listened, I suddenly understood. We were all too immature to talk about subjects like this. Our lack of basic understanding hung like a cloud that blocked any possibility of fruitful debate. The dreamy feeling I had when I watched the movie blew away, and I was left feeling somehow cheated.

I think Rosie only suggested it because films from Osea let her forget her cares for a little while. I just sat there quietly.

Rosie suddenly stood up and walked toward the grass. Her dog trotted after her.

She started to sing.

Her voice rang through the air.

She enjoyed music too.

It was a song from the movie. Her voice seemed good enough for an alto part.

I walked over to Rosie and joined in for the chorus. She glanced over at me, still singing.

The others sat watching us. The fruitless debate was over. When the song ended, Rosie returned to the benches. She took Mathilde and Lucile by the hands and led them onto the grass. I took the hands of Giselle and Reneé.

Rosie started singing again, and the others added their own voices. They were a bit off-key at first, but Rosie changed to match.

Peace was restored.

When we were finished, a group of old women sitting on a sidewalk bench waiting for the tram gave us a little applause.

"I want to make even bigger harmonies. I want to get everyone together and say, 'I want everyone to hear our voices. Hey, let's ask the school if we can form a chorus club."

Come to think of it, she might have said something like that before. Now I finally understood why.

Harmony. Real harmony.

After second period the next day, Rosie and I went to the teachers' office. We needed a piano and a couple other things. Plus, we wanted to use the music room.

Rosie was excitedly striding ahead of me and looked back.

"Don't worry. We're in this together."

"Yeah."

"I promise you. I won't leave you alone."

Even without everyone else, as long as there were two of us, we could harmonize. But I wanted to believe that was only the beginning of our journey, that we were headed toward even greater heights.

When we reached the teachers' office and began approaching the music teacher's desk, the vice principal called out to us. Well, to Rosie, really.

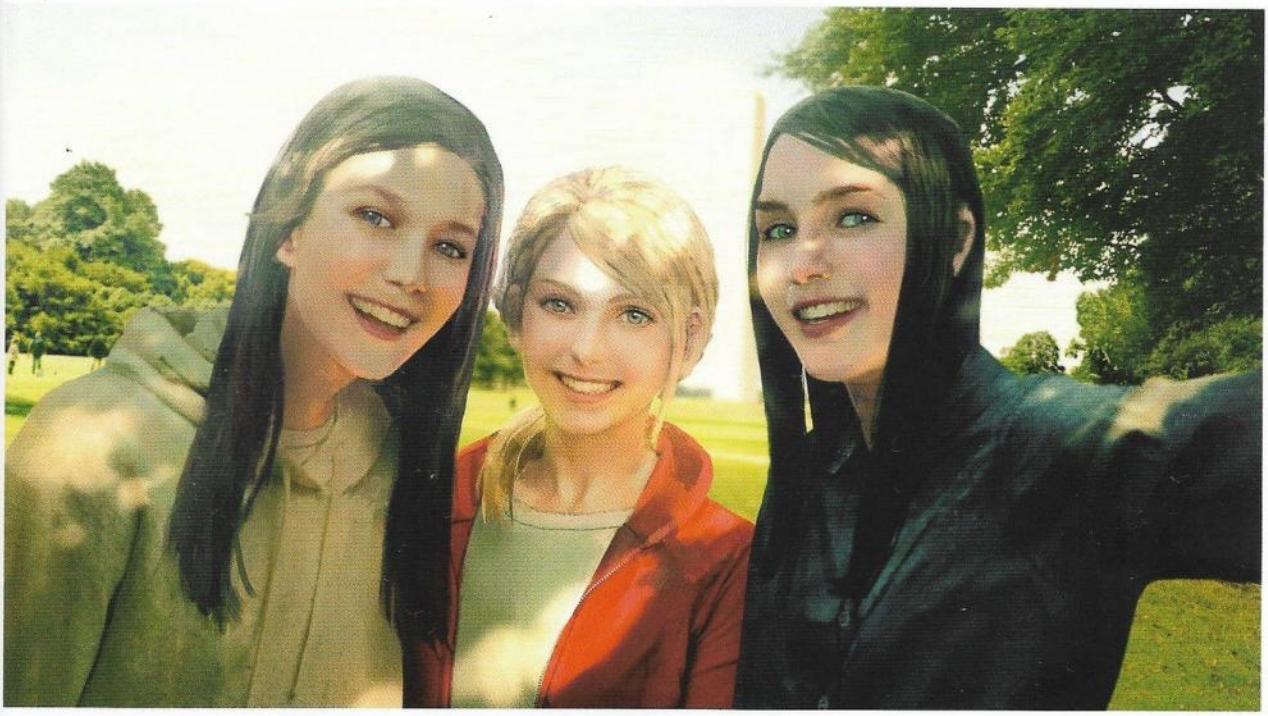
"Rosa Cossette D'Elise! You must go home at once!"

Rosie's expression went blank.

I was confused, as well. Rosie's name was Rosa Cossette Falcinelli. Why did the vice principal call her that?

The TV in the room was on, and a news program was running. The royal family had been in a car accident, and the screen showed the wreckage of their car. The anchor was saying it was a disaster and that the king and his successors had all died.

"I have to go home," Rosie said. "My father is in real trouble."



SHORT STORY

"ROSE"

I walked with her to the school gate.
"He doesn't make suits for royalty because he's the best tailor in Farbanti. It's because he's the king's cousin."
The world is a very complicated place.
The line of succession had pulled up Rosie's family, and so their name was restored to its noble roots.
My friend was now second in line to the throne.
It finally dawned on me. That's why the roses at her house were pink. They were the same color as the flag around the single white rose. It was a symbol of the royal family around the crown.
The vice principal's car pulled up to the gate. Rosie climbed in and rode away.
We haven't been able to talk to each other since.

Farbanti's royal palace, its rose-filled gardens, and the streets that had stood there for centuries were all lost when the star fell.
When the rule of kings was restored, a temporary royal palace was installed in one of the city's skyscrapers.
But now a new royal capital is being built on the outskirts. They're making it in the old style, with red tile roofs and lots of greenery. I wonder if my grandma would find it nostalgic. In my eyes, though, it just looks like one of the theme parks they have in Osea.
Are there shops and movie theaters in the new capital? Will there be friends to window shop, watch movies, talk in the park, or eat ice cream with?
The new king appeared before his subjects in a suit that he had sewn with his own hands.

Other than on TV, I only saw her once from far away. We started a chorus club. Everyone was more enthusiastic than I'd expected, and we kept it going for a long time. We made a promise, didn't we, Rosie? I never gave up on it.
We even made it to the nationals when we were in ninth grade.
We took eighth place in the end, but our rank didn't matter to me. It would've been nice to come in first, of course, but it would've still left me wishing that Rosie could be there singing with us.
Rosie was there, though. She was the princess sitting in the visitors' seats. She was far from us and didn't sing when we did. She wore a white rose on her chest.

A while after that, a new war began, and bombs began to fall on the city. Our school was one of the first places to be wiped away. Lucile's father, a former actor who ran the flower shop, lost both his wife and his store. Giselle and Reneé are both gone as well.
The voice of Princess Rosa Cosette comes over the radio.
She blames the enemy for the deaths of her classmates. She doesn't sing, but tries to bind the citizens together with her words.
We probably see things differently now. That's what I thought.
There's a good chance that our paths will never cross again. That's what I thought.

The bombing grew worse.
Waste and ruin spread through the city. There were no more secondary school boys playing football, nor any airmen around to teach them.
Erusea was losing the war.
The kingdom became a republic, which became a kingdom again. What would it become now? If it stopped being a kingdom, what would become of the girl who was second in succession to the throne?
Rumors say the leaders of the government fled to the city outskirts. I don't know if it's true or not. A group calling themselves the Revolutionary Army formed at some point and plotted to assassinate members of the royal family. There is talk of the king being wounded or even killed. I can't say whether they're right. The news across all media is ambiguous these days.
There are fewer Osean planes coming. I used this chance to go out and look for Rosie. The palace vicinity was destroyed and there were fewer soldiers around, so it was easy to get close.
All I wanted to do was search for Rosie. I thought I'd sneak her to safety if I found her. Why did I think she decided to stay there instead of evacuate? Our lives had to have changed completely by that point.

The royal palace in its tower was an empty shell. It was easy to get inside.

Rosie wasn't there. The roses in the rooftop garden were withered, fallen, and trodden upon. The faded petals, both white and pink, were an image of futility to me. I felt a brief spurt of anger that the princess didn't remain there for her people. It was followed by a sense of relief. Rosie was somewhere safe. As long as I could believe that, I was fine.

Our paths will never cross again.

That's what I'd thought.

The voice of Princess Rosa Cosette comes over the radio.

The war is over, and she wants to gather those displaced by it into a new nation under her protection. Her words call out for cooperation from the entire world.

I set out southward, toward the place she was staying. I made a promise, didn't I? I don't dream that I can somehow support her, but a promise is a promise.

I don't think about what a king looks like anymore. There's no more king, and no more princess either. Now Rosie stands in a different position altogether.

Harmony.

I'm moving toward a place with harmony.

Kazutoki Kono

BANDAI NAMCO ENTERTAINMENT
CE Business Unit Production Department 1.
Began his career as a graphic designer.
His first job in the Ace Combat series was
on Ace Combat 2 where he worked as game visual staff.
He invited Katabuchi to work on the production team for Ace Combat 04.
Handled the overall direction of Ace Combat 7 in the role of Brand Director.

BRAND DIRECTOR SCREENWRITER

Behind the Dark Blue Skies

DIALOGUE 03

Kazutoki Kono and Sunao Katabuchi, creators of much of the unique, rich world of Ace Combat take a look at Kono's cutscenes from Ace Combat 7 and talk about how they approached creating a world and characters that would capture the imagination of fans.

Sunao Katabuchi

Animation director and screenwriter. Honorary Professor of Cinema at Nihon University College of Art.

Born: August 10, 1960

Has a long history of writing and directing animation for TV and the big screen. In 2016, his film In This Corner of the World became a cultural phenomenon, going on to earn a Japan Academy Film Prize for Best Animated Film.

Has an extensive knowledge of aviation and military aircraft, and was involved in the creation of Ace Combat 04's world and script.

Ace Combat 7 marks his third time working on the series, the other entry being AC5.

The Young Define Each Generation

Kono: How did you feel when you heard about Ace Combat 7? We first spoke about it when I asked if you could recommend a scriptwriter, because I thought you would be too busy.

Katabuchi: I remember. I told you no names sprung to mind, but to be honest, I wanted to do it myself. However, I had a lot on my plate, so I wasn't sure if it was feasible.

Kono: You say that, but I recall you sending me the manuscript a week after our e-mail exchange. I was pretty surprised (laughter). I believe today was your first time watching Ace Combat 7's cutscenes, and you can see how far the story has come that we described while huddled together in that conference room in Ogikubo so long ago.

Katabuchi: The finished cutscenes show a lot of character detail: hair, wrinkles, and even dirt. This really helps bring out the theme of the game: characters who have been thrown to the ground.

Kono: You referred to Ace Combat 5—which we worked on together—as a "spy movie." This time around, though, the story was a lot weightier, so we needed greater picture quality. The combination of live action and CG really suited what we were trying to achieve. If we'd relied solely on CG, then I doubt we could've realized our vision. We originally came up with the idea after the cutscene developers, ILCA, told us that using only CG would be out of the question. But that meant the CG also had to be extremely realistic; the development staff had to go all out with the lighting, composites, post effects, and so on. In the end, I believe our efforts paid off and the story translated well onto the screen.

Katabuchi: The CG had to be at the same level as the live-action imagery. Likewise, the live-action imagery had to be lit correctly to match the CG. I think we did a really good job of combining the two. At the start, we struggled to give these almost dreamlike characters form, but here they are now fully realized and talking. After worrying about how we could let the characters communicate their thoughts, it's incredible to see them finally speaking for themselves.

Kono: Even when you were fretting over things, we'd always add to your load by saying stuff like, "We want to use drones" or "The princess is going to jump" (laughter).

Katabuchi: Actually, that helped me to develop the story.

Kono: This is going to sound bad, but at the start I was fixated on killing people.

Katabuchi: Yes, I recall you saying it would bring a seriousness and a reality to the story. At that time, I was right in the middle of working on In This Corner of the World, so you and I were on different wavelengths. We would go back and forth: "I want to kill this character here." "I don't think we should." On and on...

Kono: When I saw In This Corner of the World at a movie theatre, I finally realized what you were getting at. You can reach the audience and make them think about death by actually not killing a character. That was what you wanted to convey in Ace Combat 7: killing can be cheap and lead nowhere. I finally understood what you were saying, when the death of one of the characters struck me hard.

Katabuchi: Right after I took on the project, characters began to form in my mind, but I still needed to find a way to convey them to you. The first was Mihaly. I told you Mihaly is a grandfather who's an ace at downing aircraft, but you just responded with, "A grandfather? You mean he's old...?" I had to find a real person to act as Mihaly and show him to you. Come to think of it, that happened on AC04 and AC5 too.

Kono: Coincidentally, before this chat I was talking to Manabu Shimamoto (Ace Combat 7's producer), who is certain that Mihaly is going to be very popular, about how the last really captivating enemy ace was Yellow 13 (from Ace Combat 04) and how we'd managed to find a great one for the first time in a while with Mihaly.

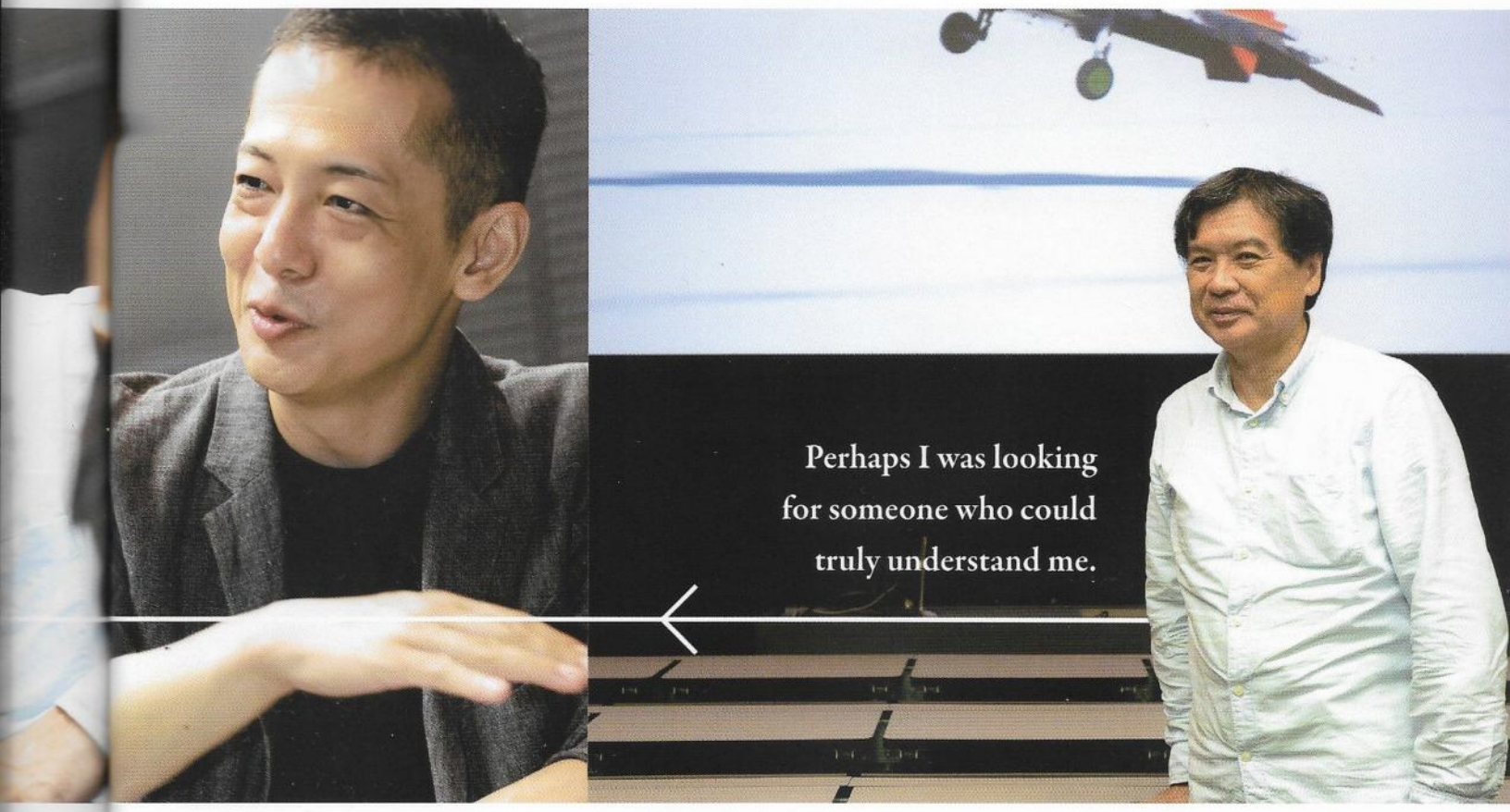
Katabuchi: Why did we start with Mihaly again? Something about needing to go with the antagonist first?

Kono: I think subconsciously we had an idea of what we wanted to say: "The young define each generation." The idea was just beginning to take form. Mihaly and the others weren't exactly behind the times, but still represented a previous generation. Drones replace manned aircraft, just as the younger generation creates a new set of rules for the world. The notion of generational change became a key concept.
If I'm honest, three years ago, I only understood your ideas about the message on the surface. Since then, though, I've become brand director and am responsible for bringing Ace Combat to a younger audience. In only three years, I've seen new systems replace old ones and felt the generational change in real time. Naturally, I started out empathizing with the protagonist, but gradually became more and more drawn to the antagonist.

Katabuchi: Around that time, In This Corner of the World had just moved from being like a side job with a few people to a full-on project. I was tired and my body wasn't functioning properly, which put a strain on my work. Even so, I felt I had to carry on fighting, like there was so much more that I could achieve. To a large extent, Mihaly came from this feeling.

Kono: You and Mihaly really have a lot in common. I know it's not part of the main game, but when I read The White Notebook (Pg. 34 in this book), I kind of felt the story was about you. You really did put yourself into Mihaly, didn't you? So, how about Schroeder? What was going through your mind when you created him?

Katabuchi: He starts out as more of a narrator, but his actions become more significant in the latter half of the story. He was born from necessity; I didn't want Mihaly to talk about himself. Mihaly's a man of few words, so I needed someone else to delve inside his mind. I suppose if Mihaly really is a projection of myself, perhaps I was looking for someone who could truly understand me.



Kono: Placing a person between Mihaly and the player also gives him an air of mystery. His reticence makes you want to know more about him and understand him better. Schroeder is to Mihaly what Avril is to the player. You could say the player is a voiceless character in the game. How about Avril's use of the phrase "dark blue"? Did you have that in mind from the beginning?

Katabuchi: I did. It pretty much sums up what Avril is after—what makes her feel at home.

Understanding the Director's Vision

Kono: When I received the Ace Combat 7 script from you, I knew we were in for a rough time. During Ace Combat 5, I raised your ire by saying I couldn't do something. You got mad and told me if a creator can no longer create, then it's all over (laughter). So I told the staff at the beginning that we can do anything; even if we have to change our approach, we'll do what needs to be done.

Katabuchi: Did I really say that? (laughter) I always take that approach to creation. Others may give up, but I refuse to, because once I give up, it's over.

Kono: Right. This time around, I stuck in there to the bitter end (laughter). You wrote the script for us first this time, and then left it in our hands. Saying we couldn't do something would have been the end of everything. The staff worked so hard to put form to your words and turn them into a game.

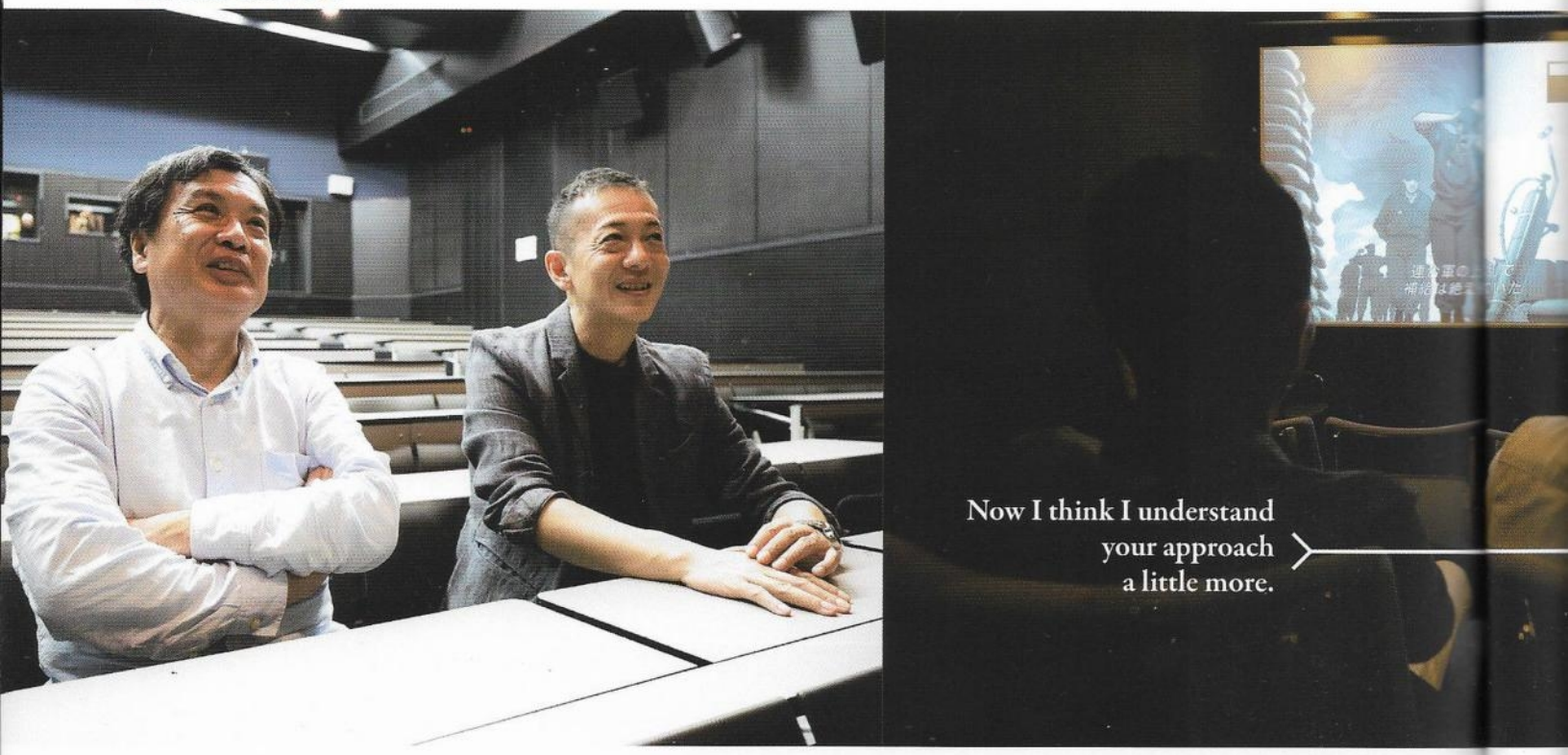
Katabuchi: Naturally, you become very attached to the characters you write. In my mind, they're real people. When I saw Avril in the final product today, I really felt she'd been captured in the way that I'd imagined her. I looked at her and thought, "So Avril's been living and breathing like this the entire time I've been away." To be honest, I had moments in meetings three years ago while we were all eating and drinking together where I did wonder to myself, "Do we all share the same vision?"

Kono: The characters were still only in our minds at the time, but by simply talking over a plan laid out in front of us and crossing off the ideas we didn't like, we were able to give them form.

Katabuchi: It all came together in the end, though. The characters I had thought up became living and breathing entities before me. Avril, Cossette, everyone was alive. To me, creating a story is about getting all sorts of people to live inside you. Still, sometimes things fall out of your hands, production gets halted, and they remain formless. When that happens, the characters have nowhere to go. They continue to live inside you like ghosts that no one else can see. When it came to Ace Combat 7, once I'd written the script three years ago, it was out of my hands. I did wonder how my characters were doing, and now I can see how much they've grown. I found myself thinking, "I know these guys."

Kono: One of the scenes from Ace Combat 7 took me by surprise and made me cry. That's when I felt I'd really been able to bring your vision to life. Of course the music and voice acting helped, but it happens whenever I watch one of your movies; I always cry in the strangest places (laughter). I don't think you meant for this, but I cried at the opening shots of the dandelions in In This Corner of the World. When I watched the completed cutscenes, there were moments like that which took me back to watching your creations.

Katabuchi: Even I get surprised at some of the scenes people cry at. But it was me who cried today. It was a very strange feeling.



Ace Combat, the Game

Kono: For the scene where Avril flies the F-104, you were adamant about showing that roller.

Katabuchi: Right, right. Avril didn't put the plane together all by herself; a lot of other people were involved. And somebody had to make the runway too. I think they were all from the same generation as her grandfather. When the F-104 takes off, you look behind the plane from the cockpit and see the roller left behind, disappearing into the distance. That struck a chord with me. It shows there's a history behind what she's doing; the engine everyone made together is running. Her grandfather's veteran friends never made it to the screen, but they're there in spirit through the tool shelves, rollers, and so on.

Kono: Hibiki Yoshizaki cut and spliced the footage this time around.

Katabuchi: I was really taken aback by what he produced; it feels so fresh. The blurred images I had in my head were there in front of me as clear as day. I liked the scene with the boxes of screws in Avril's grandfather's hangar.

Kono: Those are real boxes of screws, too. Nothing exists in CG unless you create it yourself, but real imagery is overflowing with details you had no part in creating. Because the images on screen—which incorporate real imagery—match the director's vision, the heart of the story shines through.

Katabuchi: Someone put those bolts and screws in those boxes; someone went out every day with the roller to help create the runway. We don't see them, but they are there.

Kono: And that one take expresses that idea. Hearing you talk about it really makes me glad I was able to work with you. Overexplaining characters makes them difficult to create; and you're left with a cheap and inferior product. This may just be a Japanese thing, but I think the Ace Combat players are really looking forward to imagining what's behind the unsaid and unshown.

Katabuchi: When you fill in the blanks yourself, the story becomes your own. A world forms in your mind.

Kono: The part in the script that moved me the most was "Harling's Mirror." People handle the truth in different ways. The way they look at it reveals who they are, like a mirror. I've got a few years behind me now, and looking over my own experiences, I see things just like Harling's Mirror in my work and everyday life.

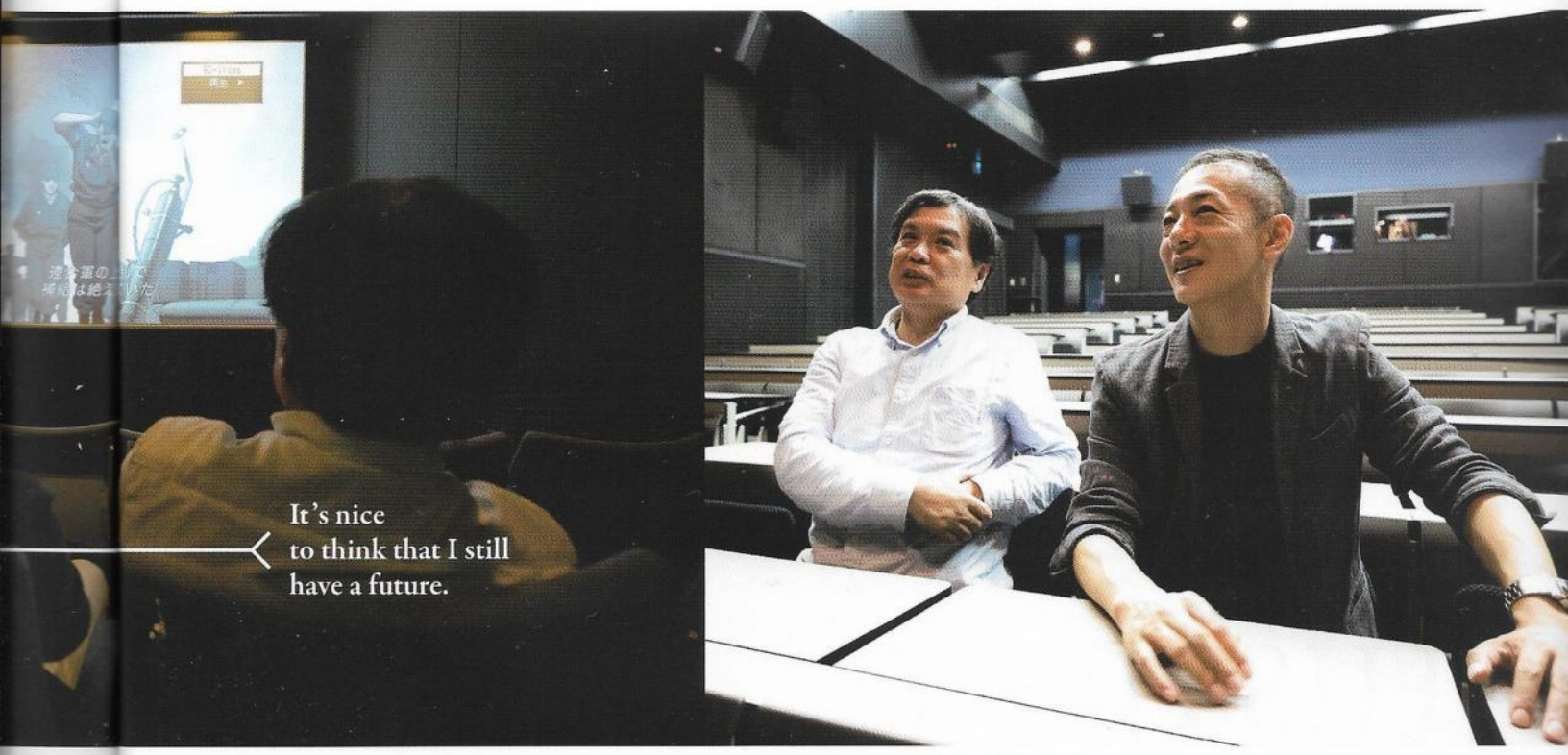
Katabuchi: I think that means we've both grown up a lot since Ace Combat 5 (laughter). It's wonderful to see all your years that went into the game. In the past, Ace Combat was just a regular shoot-'em-up. Times sure have changed. I've got no idea where the combat flight simulator aspects are in the cutscenes (laughter)!

Kono: That's what makes Ace Combat such an intriguing game. Of course it's a combat flight simulator, so it's full of the usual "Fire!" BOOM! "Whoooa!" (laughter) But as soon as your name was revealed to the fans in the press release, I think they knew what kind of an Ace Combat game to expect. And those expectations were high too. They want to watch the story unfold, but also can't wait to see what they can do as part of it. As such, we went to great lengths to, for example, make the player feel responsible for Harling's death.

Katabuchi: That's true. You have to make the player feel they have a debt to pay.

Kono: Exactly. It links to Harling's Mirror later too. And that's why I didn't want the player to treat his death lightly. Harling's actions had to remain a mystery. The majority of Ace Combat's story is told in intervals, but it—along with the visuals and drama—elevates the gaming experience. A lot depends on how short you make the cutscenes and how long you make the gameplay sections. The producers and I agree that Ace Combat provides this entertainment package well. We've been doing things this way since Ace Combat 04.

Katabuchi: Games provide something only games can. It's a new medium to work with. On Ace Combat 04, we tried to lengthen the cutscenes all the time. "Can't you give me just a few more seconds?" (laughter)



It's nice to think that I still have a future.

Kono: Making compromises over length never fails to be tricky (laughter). But looking at it now, I think we achieved a nice balance. As usual, the gameplay was in the hands of me and the crew, and the story was left to the directors. It was a case of both parties coming to an agreement and painstakingly putting it all together.

Katabuchi: We both probably went a bit too far at times, but I think you have to. When you find the limits you're working in, the puzzle starts to fit together. That's how progress is made. We make a good team, don't we? (laughter)

Kono: Once you get used to that way of doing things, it's actually quite a thrill (laughter). We had to show the magic of Avril in the game and the story of a world thrown into chaos by the destruction of its satellites, but it was incredibly tough to come up with gameplay that dealt with the question of how you would fight in a world with a complete communications blackout. How do you even play a game when you have no idea who is friend or foe?

Looking beyond AC7

Kono: When you write a script, do you imagine what happens after the story ends?

Katabuchi: I want to leave the future open to interpretation. I like to keep it vague, so I can think about things like whether a character that seems doomed to die is actually still alive. I try to live in the same time as my characters, so looking into their future is like looking into my own. I only know what happens to them as we grow old together.

Kono: So if you want to see their future, you have to walk alongside them. When we were working on Ace Combat 5, you said one time out of the blue that maybe you and Nagase were going to become astronauts. Katabuchi: That's right. I remembered saying that, so I had to make it a reality (laughter).

Kono: In the short story you're writing, After the Blue Dove (Pg. 74 in this book), I imagine Nagase doesn't become an astronaut simply because she was a pilot. After AC5 ended, she lost her way and couldn't work. I'm looking forward to reading how she managed to get herself out of her rut and become an astronaut.

Katabuchi: Naturally, she wouldn't be able to go from such an awful war to space in one fell swoop. She was able to take her life in a different direction because she managed to crawl her way out of the darkness. You need the story to feature characters who've experienced the same hurt as Nagase. I was stuck on what exactly that experience was for the longest time; however, slowly but surely characters gain a voice. Out of nowhere they start speaking to me.

Kono: Nagase's story comes from loss; she's too focused on what's gone by to commit to her work—something I've experienced myself. To move forward, you have to come to terms with the past. That thought really resonates with me. I was still very young when we started working together and unable to understand the characters' life experiences. But now I think I understand your approach a little more.

Katabuchi: Well, 17 years have passed since Ace Combat 04. Things I couldn'mt see then have become clearer to me now; it's like I'm living in another world.

Kono: So if you don't mind me asking, after having seen the finished cutscenes, do you feel glad to have written the script for the game?

Katabuchi: I do. I really do.

Kono: If the opportunity were to arise, how would you feel about working on another game in the series?

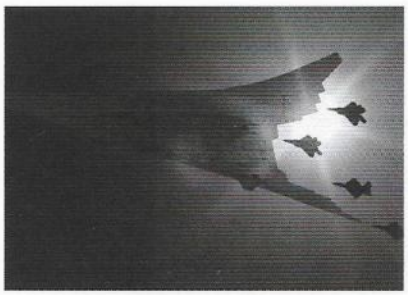
Katabuchi: You want me to take myself out of the now and into the future again? Well, it's nice to think that I still have a future.

Kono: You can go on another adventure with everyone. The fans would be pleased (laughter).

HISTORY OF WAR

2019 revised

1970s	Frequent riots for democracy erupt in the Belkan Federation's eastern states.
1980s	Osea and Yuktobania enter a state of cold war.
	Admiral Leonov of Yuktobania proposes the idea of an "arsenal ship."
	Development of Scinfaxi-class submarines begins.
	Osea proposes a "maneuverable orbiting spacecraft" as part of their Strategic Defense Initiative.



1981	The Belkan Federation begins drafting a ballistic missile defense plan.
1985	The Wellow Incident occurs in the Principality of Belka.
	Project Pendragon is launched in Belka.
	Dominic Zubov participates in conflicts all over Yuktobania as a mercenary.
1986	The Tyumen Dispute between the Union of Yuktobanian Republics and the Republic of Kaluga erupts.
	The Battle of Zhytomyr takes place during the Tyumen Dispute.
1987	The Kholm regime launches a coup d'état in the Republic of Romny in Yuktobania.
Jan. 22, 1987	The Erusean Air and Space Administration completes the basic design for the X-[illegible].
Dec. 17	The Belka Federation undergoes legal reforms.
	Belkan military expenditures increase, and political power is transferred to countries in the east while troops stationed there are withdrawn to Belka proper.
Feb. 8, 1988	The Republic of Gebet gains its independence.
May 12	The Republic of Ustio gains its independence.
Mar. 14, 1990	Large-scale offshore oil rigs in northeastern Estovakia are abandoned and later managed by a public corporation for resource development.
May 15, 1990	A nature conservation activist group clashes with Belkan security forces near the Excalibur construction site. A few injuries result.
	The entire Tauberg region is designated a restricted zone.
Jun. 23, 1990	The Osean Air Defense Force establishes Wizard Squadron.
Oct. 8	Construction begins on facilities to protect the Excalibur base.
	Osea declares rearmament.
	Estovakia abandons its northeastern offshore oil facilities.
Aug. 16, 1991	The Great Lakes Resource Development Company, jointly financed by Osea and Belka, is discovered to have been covering up the fact that it has been operating at a loss.
Aug. 29	Belka cheaply sells territory in its north to FATO.
	Belka sells its eastern territory to neighboring eastern nations.
	Belka cedes northern islands and the Great Lakes region to the Osean Federation.
Sep. 2	Scinfaxi-class submarines are announced to the world at a political convention in Cinigrad, Yuktobania.
	Minister of Foreign Affairs Howards of the Osean Federation belittles Yuktobania's announcement of a new class of submarine.
Dec. 16	Belkan borders are redrawn.
	Belka's eastern territories are divided between Ustio and Gebet.
	The Osean Maritime Defense Force orders the construction of the Kestrel, the seventh Hubert-class aircraft carrier.
Feb. 24, 1992	The Belkan Liberal Democratic Party wins a single-party majority.
Oct. 4, 1994	The asteroid 1994XF04 is discovered by researchers at Seals Bridge University.

During the Rectan Conflict, Dietrich Kellerman leads the Silber Team over the Mainz Mountains, taking control of the air and allowing ground forces to occupy the city of Cor. Kellerman is honored as the Hero of Mainz.

This leads to the development of the Excalibur defensive laser system.

Silber Team shoots down a group of unidentified aircraft violating Belkan airspace near Crescens Island in the north.

Development of mass retaliation weapons and chemical laser cannons begins. Anton Kupchenko takes part in the project.

Dominic Zubov's unit, Yuktobania's 9th Air Division 112th Tactical Fighter Squadron, emerges victorious.

Dominic Zubov helps suppress the rebellion.

Independence is possible after Belka falls into a deep economic recession and the laws of the federation are revised.

From this point, separatist and independence movements expand throughout the Belkan Federation.

Osea is believed to have secretly funded the independence movement in Ustio in hopes of access to underground resources.

The unit's main members include Joshua Bristow, Carlos Joaquin, and Lucio Morientes.

Anti-Oscan sentiment in Belka rises with the suspicion that the cession of territory was planned by the Osean Federation from the beginning.

Similarities to the FCU's Dragonet-class submarines are pointed out, indicating the new submarines may be counterfeits.

Gebet and Recta are divided.

Ustio cedes land in its east to Ratio.

The asteroid is later named Ulysses.

"If I meet my equal in battle someday, I will not begrudge his shooting me down if I'm able to put every last ounce of my skill and training to use."

November 23, 2004

These are the words of Yellow 13 according to the testimony of a war orphan from the Continental War. While the specifics are unclear, he is presumed to have said this right before Erusea's Aegir Fleet was destroyed. Such statements typify his belief that ultimate responsibility should lie with the pilot.

Dec. 10 The International Astronomical Union announces that the asteroid Ulysses will pass close to Earth in the near future with a chance of impacting and causing great devastation.

Dec. 23, 1994 Belka completes Excalibur.

Mar. 25, 1995 The Belkan War breaks out.

Mar. 27 On Belka's eastern front, there is an assault on Model, a border city in Gebet.

Dimitri Heinreich leads Indigo Squadron against FATO's 3rd Air Division 122nd Fighter Squadron and shoots down nine of their F-14Ds within five minutes of the battle starting, earning instant fame.

Mar. 30 Nearly all of the Republic of Ustio falls under Belkan control.

The Belkan Air Force clashes with the Ustio Air Force over Monte Rosa.

Apr. 1 Ustio enters an alliance with Osea and begins its resistance.

Apr. 3 The Osean Army begins its resistance.

Erich Hillenberand shoots down six planes, earning great renown.

Apr. 24 Allied Forces enact Offensive Campaign No. 4101 to drive the Belkans from Futuro Canal and secure a marine supply line. The Osean aircraft carrier Kestrel undergoes a test voyage.

May 13 Allied Forces liberate Ustio's capital Directus from Belka.

May 14 The independent country is restored to its prewar state.

May 17 Belka's V2 development plans for a mass retaliation system are discovered and Allied Forces decide to advance into Belka.

Mar 23 Allied Forces destroy Excalibur.

Jun. 1 Allied Forces bomb the Belkan industrial city of Hoffnung.

~Jun. 4 Southern cities in Belka declare themselves demilitarized "open cities."

Cities surrender peacefully to Osea or Allied Forces from independent nations.

Jun. 5 The Battle of Waldreich

Allied Forces lay siege to the city of Sudentor, which is defended by only three regiments as the Belkan Army's retreat is delayed by narrow roads through the mountains.

Wizard Squadron and Sorcerer Squadron of the Osean Air Defense Force leave the front line, and contact with them is lost.

Jun. 6 The Belkan Army uses seven nuclear devices in the Waldreich Mountains.

The Belkan Army undergoes a complete disarmament south of Waldreich.

Larry Foulke of the Ustio Air Force's Galm Team disappears.

The Belkan Federation is broken up, leaving only a portion of the Principality.

Jun. 20 A treaty is signed in Lumen. The Belkan War ends.

Southern Belkan territories are ceded to Osea. This land becomes North Osea.

Oct. 18 Espada Team disappears from a base belonging to the Kingdom of Sapin.

Dec. 25 A World With No Boundaries launches a coup.

An XB-0 bombs Lumen and Valais Air Base before being shot down by Galm Team.

Dec. 31 Allied Forces attack V2 launch facilities at Avalon Dam Fortress and defeat the rebellion.

Robert Tyler, commander of the FCU Army Southern District, eliminates a rebel base in the Skully Islands in southern Usea.
Dominic Zubov participates in conflicts all over Yuktobania as a mercenary.

1995 Unified Command defeats rebel forces in the Skully Islands thanks to the actions of Scarface Squadron.

Jan. 17, 1996 Waldemarr Rald, head of the Rald Faction, is overthrown in Belka.

Lieutenant General Blauvelt of the 6th Air Division leads a reformation of the Belkan Air Force.

Apr. 18 The FCU Army announces that Commander Robert Tyler (54) will replace the Riass Armed Forces Chief of Staff who suddenly passed away on March 20.

In the previous year, Tyler had served as commander of the FCU Army Southern District and eliminated a rebel base in the Skully Islands.

Apr. 20 The President of the FCU makes a global announcement that Ulysses will impact Earth. He also announces plans to counter it.
Richard Payne, the head of the FCU Department of Defense, orders all personnel under FCU command to temporarily return home.
FCU Secretary of State Stateson explains to UTO headquarters how a National Missile Defense (NMD) system could be used to protect against the asteroid's impact and seeks the understanding of the allied nations.

A mainland missile defense network is constructed to defend Central Usea Treaty Organization (UTO) allies. More underground shelters are built in major cities. Troops stationed in foreign territories are withdrawn. Communication networks for personal use such as the internet and cell phones are regulated to prevent any instability resulting from the spread of rumors or false information.

The 6th fleet deployed in the Far East sails toward its home port of Waosun.

FCU troops withdraw from the their standoff with the Erusean Army in the south of Republic of Amber bordering the autonomous state of Ugellas, forcing the IUN to withdraw in turn.

An assassination attempt is made on the President of Osea.

Immediately beforehand, a secret message is sent out, likely from former Osean Air Defense Force Wizard Squadron pilot Kevin Shore, allowing Osean special forces to assault the plotters' hideout in time. Former Osean Air Defense Force Wizard Squadron members Evan Carey and Ethan Button are killed. Iosif Beletsky is arrested as the ringleader. Wizard Squadron's Captain Joshua Bristow is also arrested for involvement in the plot, which was done out of protest to the Yuktobanian Peace Treaty.

May 30, 1997 Rebellion breaks out.
A coup d'état is carried out all across Usea. Unified Command defeats rebel forces thanks to the efforts of Scarface 1.

Jun. 19, 1998 The FCU completes Stonehenge in a desert region of the neutral country San Salvacion.

Former top pilots from the Belkan Air Force are hired by various countries and work as aggressor squadrons. The Erusean Air and Space Administration begins development of the X-02.

Osea and Yuktovania had originally intended to participate in the project, but reconstruction after the Belkan War prevented this.

Jul. 29, 1998 The International Astronomical Union's (IAU) official monthly damage estimate for the impact of the asteroid Ulysses is revised to include the possibility of fragments falling on the eastern portion of the Anean continent.

Sep. 20 Construction of a Ulysses evacuation shelter begins in the castle in the capital of Emmeria.

July 8, 1999 Ulysses passes through Earth's Roche limit.

Half a million people die in the first two weeks. The FCU has countless refugees, and the government asks Erusea for assistance.

Estovakia's Chandelier asteroid intercept system is unable to be deployed in time, and many fragments impact. The nation is beset by an economic collapse.

Shelters built in Emmeria's cities are believed to have kept the nation's casualties lower than Estovakia's.

Sep. 16 The Osean Maritime Defense Force aircraft carrier Kestrel goes into commission.

Oct. 8 Osea and Yuktobania cooperate to convert the Arkbird into a platform for clearing satellite orbits of debris.

Jan. 10, 2000 Emmeria enacts an aid program to help Estovakia recover from Ulysses.

Assistance is later frozen due to delayed infrastructure repairs, chronic material shortages, as well as conflicts and looting by certain military factions.

Apr. 21, 2000 Erusea stops taking in refugees.

Mar. 20, 2002 Osea, Emmeria, and other nations join in economic sanctions against Estovakia, citing internal corruption.

Summer 2003 Erusea invades the neutral country of San Salvacion.

Erusea seizes Stonehenge and begins using its railguns as anti-air batteries.

Aug. 22 The President of the FCU demands Erusea withdraw from the railgun complex and San Salvacion.
FCU President Robert Sinclair establishes the ISAF.

Sep. 14 The ISAF is defeated by Stonehenge's ability to control the air and is forced back to Los Canas.

The ISAF initiates its first offensive against Stonehenge, but is defeated.

Feb. 1, 2004 The Preparatory Agency for the Republic of Anea is established to realize the Republic of Anea Initiative in unifying the continent of Anea into a single country.

Sep. 16, 2004 The ISAF establishes its headquarters in North Point.

Oct. 10 The radar facility at the top of Mount Shezna is destroyed to cover the retreat of the ISAF forces gathered in Saint Ark.

Nov. 23 The ISAF attacks Erusean forces anchored at Comberth Harbor and sinks the "invincible" Aegir fleet.

Dec. 31 The ISAF and Erusea clash in a large-scale air battle over the Comona Islands.

Vincent Harling becomes the 48th President of the Osean Federation.

Jan. 24, 2005 The ISAF lands on the Usean continent.

Feb. 28 The ISAF takes Istas Fortress to breach the Erusean Army's defensive Tango Line.

Mar. 14 Engineers and their families escape from custody at Stonehenge, where they were kept by Erusea, allegedly for their protection.

Apr. 2 The ISAF destroys Stonehenge.

Jun. 18 The ISAF makes a northern landing on the Usean continent at Ice Creek.

Jul. 10 The ISAF liberates San Salvacion.

Aug. 15 The ISAF breaks through Whiskey Corridor, Erusea's last line of defense.

Sep. 19 The Erusean capital Farbanti falls, and the ISAF accepts Erusea's surrender. The Continental War ends.

Sep. 26 Young Erusean military officers seize Megalith.

Megalith is destroyed by the ISAF's Mobius Squadron.

Erusea starts a provisional autonomous government under ISAF oversight.

The documentary Warriors and the Belkan War is broadcast on the OBC television network in Osea.

Sep. 26, 2006 Free Erusea begins an armed insurrection.

Free Erusea is defeated by Mobius 1.

Apr. 3, 2007 The Lyes Faction (later the Lyes United Front) seizes control of the Estovakian capital.

Jun. 30 The Lyes United Front (LUF) begins to suppress cities who resist their rule, and other factions begin to revolt, leading to the Estovakian Civil War.

Jul. 15, 2008 Estovakia's Eastern Faction takes and restores oil platforms in the northeast of the country that were held by a public corporation.

Oct. 23 The Republic of Anea Initiative is put on hold because of internal strife in Estovakia.

Aug. 21, 2008 The Arkbird Summit is held.

Feb. 19, 2010 Emmeria discontinues aid for the LUF's reconstruction program due to the LUF's suppression of all opposition.

Capacity is reached after accepting 200,000 refugees, and visa requirements are made more stringent.

The withdrawal deadline is set for Sep. 14, after which the FCU and allied forces will attack.

This causes the Erusean Army to indefinitely suspend their invasion of North Point.

Progress is made with an appeasement policy between Osea and Yuktobania.

They flee aboard Air Ixiom Flights 701 (co-piloted by Kei Nagase) and 702.

Anea, Central Usea, Osea, Yuktobania, Verusa, the Nordlands, and the provisional Erusean autonomous government attend to decide on matters such as arms reduction and nonproliferation.

Other agreements are made regarding the recent refugee problem in Usea caused by the Ulysses Impact Event and the Continental War.

The Comprehensive Nuclear-Test-Ban Treaty (CTBT) is signed.

The Second Strategic Arms Reduction Treaty (START2) is signed.

The Group of Seven Summit is held on the Arkbird maneuverable orbiting spacecraft.

"History determines the winner. But there's one thing I can say for certain. Heroes really do exist."

September 26, 2005

Sky Eye, an ISAF Air Force controller, made the above radio statement after witnessing Mobius 1, the ace pilot who helped lead the ISAF to victory in the Continental War, destroy Megalith and miraculously make it back alive. This quote vividly portrays a single truth about the kind of person it takes to end a war.

Sep. 23, 2010 Unidentified aircraft appear in Cape Landers, Osea. The Osean Air Defense Force's Wardog Squadron engages, but only two aircraft survive.

Sep. 24 An unidentified SR-71 reconnaissance plane appears in Osea. A Coastal Defense Force surface-to-air missile hits it.

Sep. 27 Wardog Squadron engages unidentified aircraft. Yuktobania declares war on Osea and attacks Port Saint Hewlett. The Circum-Pacific War begins.

Wardog Squadron's flight leader Jack Bartlett is shot down and taken prisoner.

Sep. 30, 2010 The Scinfaxi, the first of Yuktobania's Scinfaxi-class submarines, sees its first use in war.

The Osean Maritime Defense Force aircraft carriers Vulture and Buzzard are sunk at Eaglin Straits.
Osea sends the Arkbird to the front line.

Oct. 4 The Yuktobanian submarine Scinfaxi is sunk at Sand Island.

Oct. 22 The Akerson Hill Incident

Osean Federation President Vincent Harling is taken captive en route to the neutral country of North Point.

Vice President Appelrouth assumes presidential duties and the Osean government takes a more militant position.

Oct. 25 Explosives smuggled onto the Arkbird with other supplies destroy the aircraft's engines, leaving it inoperable.

Nov. 1 Osea begins an invasion of the southeastern Yuktobanian mainland on the southern coast of the Bastok Peninsula.

Nov. 2 Osean aircraft fire on an engineering college in the Yuktobanian city of Dresdene, resulting in multiple fatalities.

Yuktobanian sentiment toward Osea worsens.

Military investigators recall Wardog Squadron to the Osean capital of Oured for questioning on the suspicion of having caused the incident.

Nov. 4 Yuktobanian special forces use nerve gas in a terrorist attack in the Osean Federation's college city of Bana.
Yuktobanian forces make a surprise attack against Apito International Airport in the Osean Federation.

Nov. 14 The Yuktobanian submarine Hrimfaxi, the second of their Scinfaxi-class submarines, is sunk in the Razgriz Straits.

Nov. 29 Yuktobanian aircraft attack during a peace ceremony in the Osean Federation's November City.

Wardog Squadron participates in the ceremony, and Captain Alvin H. Davenport is shot down and killed.

Dec. 6 Osean forces bring down Cruik Fortress, Yuktobania's final defensive stronghold.

Dec. 7 Peter N. Beagle and Albert Genette help Wardog Squadron members suspected of espionage flee aboard training aircraft, but all are shot down by Captain Marcus Snow, who was in an F-14A assigned to the aircraft carrier Kestrel.

Dec. 9 Osean Federation President Harling is rescued from imprisonment at Stier Castle in the Principality of Belka.

Razgriz Squadron is formed and serves directly under the President of the Osean Federation.

Dec. 19 The Arkbird, carrying a nuclear weapon, uses friction to maneuver into the atmosphere to make an attack on the Yuktobanian city of Okchabursk.

The Arkbird is shot down by Razgriz Squadron.

Osean astronaut and technician John Harvard escapes from the Arkbird.

Dec. 23 Seryozha Viktrovich Nikanor, former Prime Minister of the Union of Yuktobanian Republics, who was imprisoned by the Yuktobanian military, is rescued.

Dec. 29 The Battle of Ceres Ocean

Yuktobanian ships siding with the Osean Maritime Defense Force's Kestrel clash with the Yuktobanian fleet before the Osean naval fleet joins, resulting in a three-way battle.

Razgriz Squadron launches from the carrier and defeats the aggressors.

Dec. 30 The Osean aircraft carrier Kestrel is sunk.

President Harling of the Osean Federation and Prime Minister Nikanor of the Yuktobanian Republic hold a televised address requesting their militaries to disarm.

A mixed Osean and Yuktobanian force performs a forced inspection of Gründer Industries facilities in the Osean trust territory of Sudentor, North Osea.

The control facility for the SOLG attack satellite is destroyed.

Dec. 31 Astronomers spot the SOLG falling and provide estimated landing coordinates to the Osean military.

Razgriz Squadron shoots down both the Grabacr and Ofnir Squadrons of the former Belkan Air Force.

Razgriz Squadron destroys the SOLG before it can hit the Osean capital of Oured.

The Circum-Pacific War ends.

May 9, 2011 Emmeria discontinues aid for Estovakia's reconstruction.

Jan. 15, 2013 The Eastern Faction and LUF clash. The superior numbers of the LUF are overwhelmed by the Eastern Faction's new weaponry and elite aviation units, resulting in a loss of 80% of its territory in one week.

On January 15, 2013, General Lyes engages in a full offensive against the Eastern Faction with the intent of ending the civil war. However, the Eastern Faction's new weapon, the Aigaion, and elite units like Strigon Team and Vampire Team work in concert to turn the tide, and the LUF loses 80% of its territory in just one week.

Oct. 29 The LUF continues to fight, but suffers a major loss near the border with Emmeria in which General Lyes is killed, and the Estovakian Civil War ends.

Later, the LUF fights as they retreat, but suffers a crippling defeat near the border with Emmeria. General Lyes dies in battle, and the civil war comes to a close.

Nov. 25 Estovakian Foreign Minister Isaac Arensky (former air marshal of the Northern Highlands Faction) is left unconscious in a sudden attack. One week later, fifteen former LUF soldiers are arrested for the crime.

Dec. 2 Foreign Minister Arensky dies, but this information is withheld from the public.

Dec. 23 Talisman joins the Republic of Emmeria Air Force. He is assigned with defending the skies over Gracemeria, the capital of Emmeria.

Feb. 3, 2014 The death of Estovakian Foreign Minister Arensky is made public, and Antonina Koznick (a former captain in the Eastern Faction navy) is named as his successor.

Feb. 4 An armed force of former LUF members attacks a temporary storage facility for relief supplies in the western Estovakian city of Vistoc.

April 21, 2015 Yuktobanian spy satellites spot a massive aircraft signature near the southeast coast of Estovakia.

The signature is lost four days later near Estovakia's northeastern offshore oil facilities.

Jun. 10 Ed Alverez is assigned command of the Gavial tank battalion. Hostilities break out immediately after the assignment, and the battalion is put in charge of a defensive line of cities amid the confusion.

Sep. 12 Freddie Durand, call sign Avalanche, becomes flight leader of the 2nd Strike Fighter Squadron.

Nov. xx Witnesses see multiple giant fireballs attacking Emmerian forces as they retreat in multiple locations.

Aug. 30, 2015 Estovakian forces begin an invasion of Gracemeria, the capital of the Republic of Emmeria.

Base and carrier air squadrons are unable to counter the heavy command cruiser Aigaion, and Estovakian forces seize Gracemeria.

Emmerian forces decide on a retreat to western Anea. The Emmeria-Estovakia War breaks out.

Nov. 14 Estovakia sends a large formation of bombers toward the city of Vitoze on Khesed Island. Remaining Emmerian forces based at Campagna Airport succeed in intercepting them.

Nov. 27 Aiming to retake Khesed Island, Emmerian ground forces break through the Estovakian front line base at Sipli Field.

Dec. 27 Bartolomeo Fortress falls. Emmerian forces establish full control of Khesed Island.

Jan. 26, 2016 Emmerian land, air, and sea forces make a successful landing offensive at Rargom Beach on the western edge of Anea and establish a bridgehead.

Feb. 12 Emmerian ground forces move east along the Selumna Peaks.

Feb. 15 Emmerian forces capture Cavallia Air Force Base located in San Loma

Feb. 20 The Emmerian Air Force attacks and destroys the Aerial Fleet, restoring air superiority to Emmerian forces.

Mar. 6 Emmerian forces make a decisive strike on Ragno Fortress in Grageo Canyon.

Mar. 25 A large-scale battle between Emmeria and Estovakia breaks out in the Moloch Desert. Estovakian forces retreat.

Mar. 26 Emmerian forces assault the mining city of Fort Norton. Estovakia is prevented from transporting catalysts for weapons of mass destruction.

Mar. 31 Emmerian forces undergo an operation to liberate Gracemeria which ends in success.

That night, a large number of cruise missiles are fired at the city, but are shot down in midair by patrolling fighters.

Apr. 1 Emmerian forces destroy the Chandelier on Sonne Island. Gustav Dvornik, one of the main architects of the invasion of Emmeria, dies.

There is an antigovernment coup in Estovakia, leaving their forces unable to fight, which leads to a ceasefire agreement.

Later, Emmerian forces remaining on the continent carry out four King & Balloon Operations to recapture Gracemeria, but all fail due to counterattacks by Strigon Team and the Aigaion.

Roughly 90% of mobilized forces are sent into this operation, and many soldiers who participate call it "a gamble. Emmerian forces are able to spread into the center of Khesed Island, while Estovakian forces withdraw northward to Bartolomeo Fortress on Mount Marcello.

The Aerial Fleet flagship, the Aigaion, is unable to effectively detect an enemy approach while refueling. The Emmerians exploit this in what could be called a surprise attack, and while the rest of the Aerial Fleet join the battle along with Strigon Team, they are all ultimately lost.

Later analysis reveals that the missiles were launched from the Chandelier system that was built to prevent the impact of Ulysses in 1999. The Emmerian Air Force moves toward the Arctic Ocean.

"I've lost time and time again... but now I've finally won."

Nicholas A. Andersen

These were the words of Captain Andersen of the Osean Maritime Defense Force 3rd Fleet aircraft carrier Kestrel immediately after Razgriz Squadron took off from the sinking carrier.

His work was vital in bringing two opposing nations together and leading them toward peace.

May. 15, 2019 Terrorist strikes by drones occur at four major naval ports in Osea.

On the same day, the Kingdom of Erusea declares war on the Osean Federation.

Erusean forces capture the International Space Elevator.

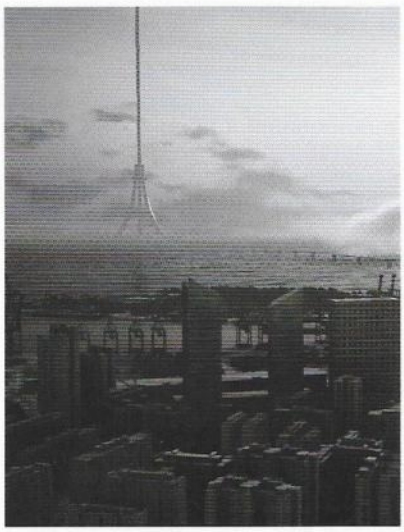
The Lighthouse War begins.

One reason the Erusean Army's preemptive blitzkrieg was so effective is because it rapidly neutralized military installations throughout Osea and the Usean continent. The attack came from countless drones released from cargo containers sent all over the world from Erusea, and this temporarily paralyzed the distribution of goods everywhere.

May 17 Osean forces work with the IUN Peacekeeping Force in Operation Eastern Wind. The advance into Erusean-held territory begins.

May 30 A two-pronged offensive is made in an attempt to secure Chopinburg airspace and attack the Erusean capital of Farbanti. The aircraft carrier Kestrel II, a cornerstone of the attack on Farbanti, is sunk. The offensive ends in failure.

Multiple casualties occur in the city of Farbanti from friendly fire incidents by Osean forces.



Jun. 6 Osean forces attempt to rescue former president Vincent Harling from the space elevator. The former president is caught in an attack during the operation and dies.

Aug. 10 Osean forces form the Long Range Strategic Strike Group in hopes of ending the war quickly.

Issuing a long-range strategic strike requires finding a hole in the auto-intercept system's warning network. To do this, the Osean military sends a flight group comprised of penal inmates toward the warning network in dangerous armed reconnaissance missions to gain intelligence.

Aug. 19 Osean forces reactivate one of Stonehenge's anti-asteroid batteries and shoot down the Arsenal Bird Liberty.

Sep. 19 Osean forces begin an attack on Farbanti.

An operation to destroy military satellites cuts off network communications across the entire Usean continent.

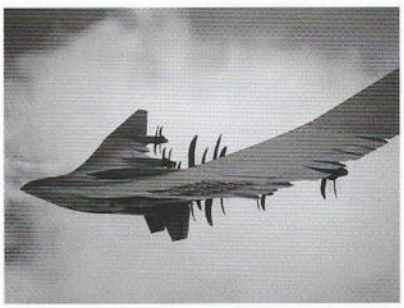
Oct. 1 The autonomous state of Shilage and other small nations annexed by the Kingdom of Erusea declare independence.

The Erusean government refuses to recognize their independence, resulting in internal conflict.

One squadron calling themselves the Voslage Air Force after the defunct nation engages in hostilities against the Erusean Army.

Oct. 10 Erusean conservative General Édouard Labarthe is killed by Osean forces.

Friendly fire incidents occur among all of Osea's regional forces across Usea. The cause is initially believed to be a dispute over authority to give orders, but later investigation proves it was because of data manipulated by Erusean engineering units.

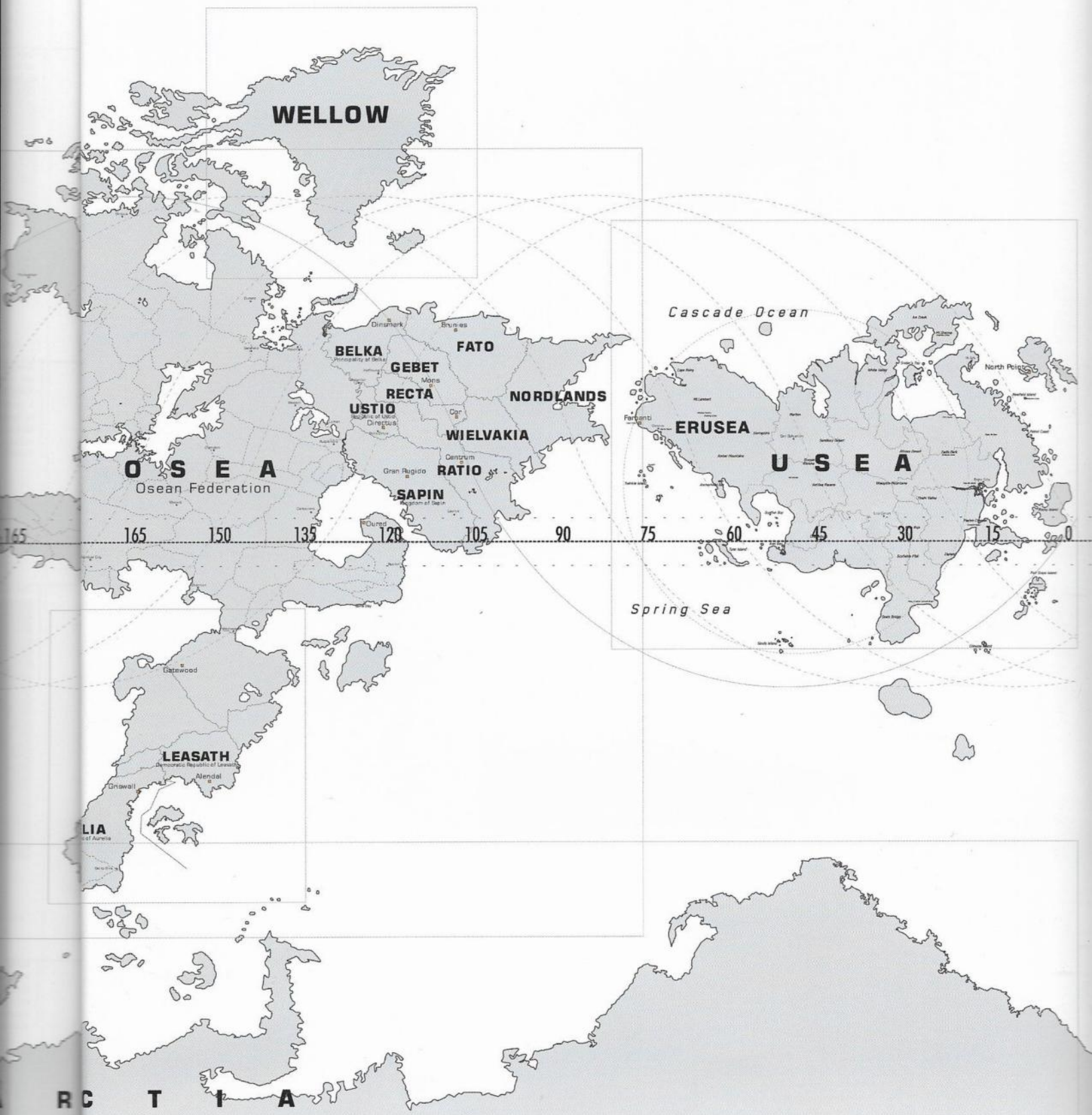


Oct. 31 Osean and Erusean forces clash near the space elevator.

The Arsenal Bird Justice is shot down.

Dec. 1 Osea and Erusea sign a ceasefire treaty at the Expo City Conference.

NORDENNAVIC
Kingdom of Nordennavic
EMMERIA
Republic of Emmeria
ESTOVAKIA
Federal Republic of Estovakia
Khesed Island
YUKTOBANIA
Union of Yuktobania Republics
0
15
30
45
60
75
90
105
120
135
150
165
SOTOA
VERUSA
A N T A R C


WELLOW
Dinsmerk
Brunies
BELKA
FATO
GEBET
Mons
RECTA
NORDLANDS
USTIO
Car
WIELVAKIA
Centrum
RATIO
Gran Rugido
SAPIN
Ourea
O S E A
Osean Federation
Cascade Ocean
North Pole
Fairbanti
ERUSEA
U S E A
Spring Sea
165
150
135
120
105
90
75
60
45
30
15
0
Gatewood
LEASATH
Democratic Republic of Leasath
Alendal
Griswall
LIA
A R C T I A

Editor & Designer	Ayuki Mitsumata
CG Works	Xiaoxin Zhao (ILCA.inc)
Illustrator	Kazuma Koda
Columnist	Kentaro Seki
Photographers	Tsunenobu Miyahara (goningumi)
	Toshiki Fukazawa (RawLight)
	Takeshi Hirabayashi (grasshopper)
Interviewers	Sunao Katabuchi
	Hibiki Yoshizaki (Studio khara)
	Yoshio Aoki (College of Science and Technology, Nihon University)
Special Thanks	LOCKHEED MARTIN
	SOMETIME kichijoji
	Nihon University College of Art
	College of Science and Technology, Nihon University
	Nihon University
	JAPAN SPACE ELEVATOR ASSOCIATION
Consultants	Kanno Masato (BANDAI NAMCO Studios Inc.)
	Kosuke Itomi (BANDAI NAMCO Studios Inc.)
	Kazutoki Kono (BANDAI NAMCO Entertainment Inc.)
Localization	Marina Komatsu (BANDAI NAMCO Entertainment Inc.)
	Chika Akashi (BANDAI NAMCO Entertainment Inc.)
	Erica Haga (BANDAI NAMCO Entertainment Inc.)
	Yasuhiro Sugiyama (BANDAI NAMCO Entertainment Inc.)
Producer	Makoto Sekiya (ILCA.inc)
	Tomomi Arakawa (BANDAI NAMCO Entertainment Inc.)
	Manabu Shimomoto (BANDAI NAMCO Entertainment Inc.)

ACES at WAR
A HISTORY
2019

2019. January 18th issue

Editing / Production	ILCA.inc
Printing	OffBeat Productions Inc.
Publisher	BANDAI NAMCO Entertainment Inc.

ACE COMBAT™ 04: shattered skies & ©2001 BANDAI NAMCO Entertainment Inc.
ACE COMBAT™ 5: THE UNSUNG WAR & ©2004 BANDAI NAMCO Entertainment Inc.
ACE COMBAT™ ZERO: THE BELKAN WAR & ©2006 BANDAI NAMCO Entertainment Inc.
ACE COMBAT™ 7: SKIES UNKNOWN & ©2019 BANDAI NAMCO Entertainment Inc.

© DigitalGlobe, Inc. All Rights Reserved.
All trademarks and copyrights associated with the manufacturers, aircraft, models, trade names, brands and visual images depicted in this game are the property of their respective owners, and used with such permissions. ACE COMBAT™ 6: Fires of Liberation & ©2008 BANDAI NAMCO Entertainment Inc.

©GeoEye/JAPAN SPACE IMAGING CORPORATION.
本書の無断複写・複製・転載を禁じます。

FIGHT THE UNKOWN

ACE COMBAT™ 7: SKIES UNKNOWN & ©BANDAI NAMCO Entertainment Inc.
© DigitalGlobe, Inc. All Rights Reserved.
All trademarks and copyrights associated with the manufacturers, aircraft, models, trade names, brands and visual images depicted in this game are the property of their respective owners, and used with such permissions.

Все артбуки даром! Лучшая и самая большая коллекция! Ежедневное обновление!

Легко смотреть и всё можно скачать! Ищи архив здесь: vk.com/freeartbook

All artbooks for free! The best and biggest collection! Daily update!

Easy to look at and everything can be downloaded! Search the archive here: vk.com/freeartbook